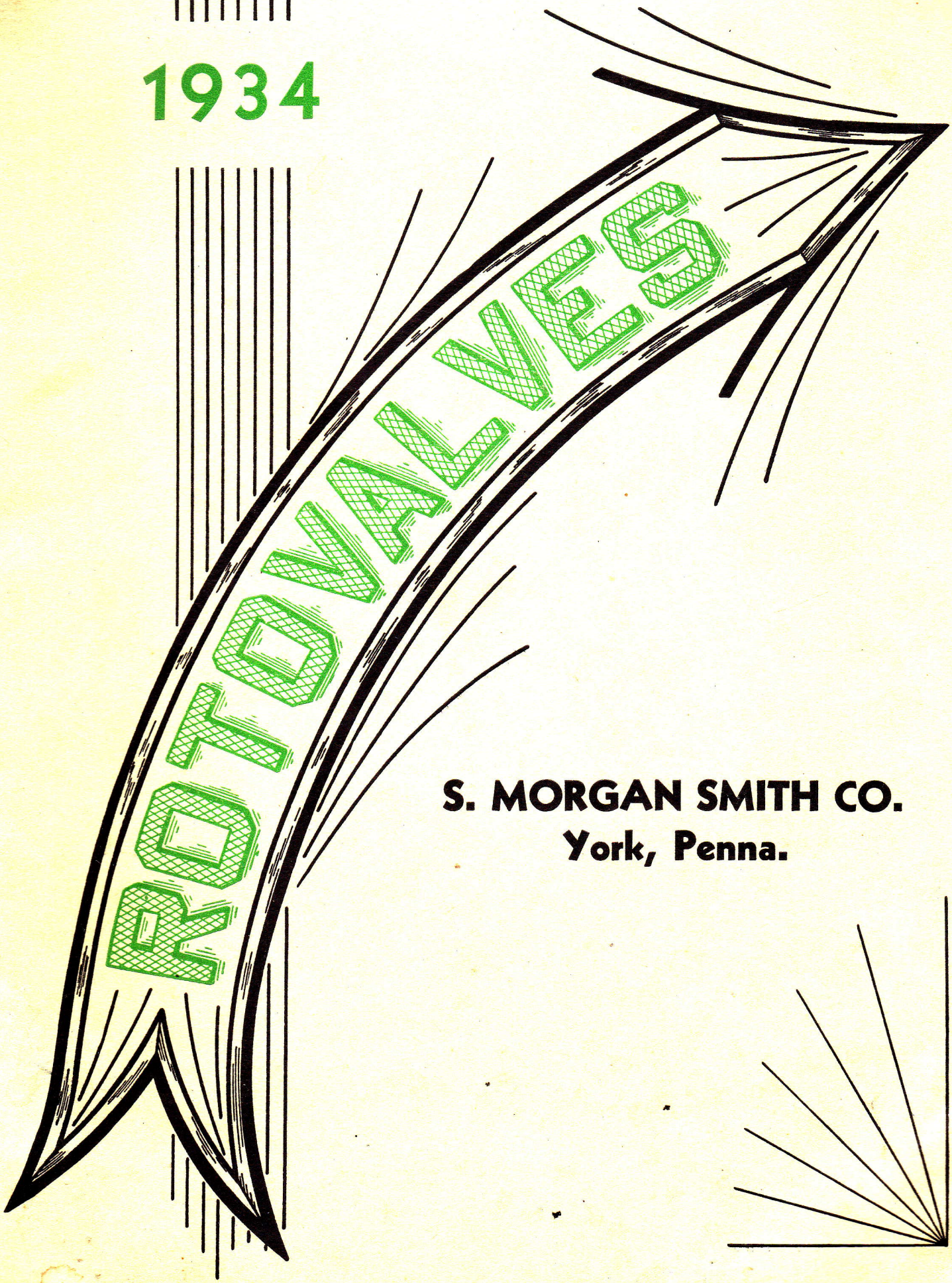
1934



S. MORGAN SMITH CO.
York, Penna.

BULLETIN RV-130

ROTOVALVES

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S. MORGAN SMITH COMPANY PLANT
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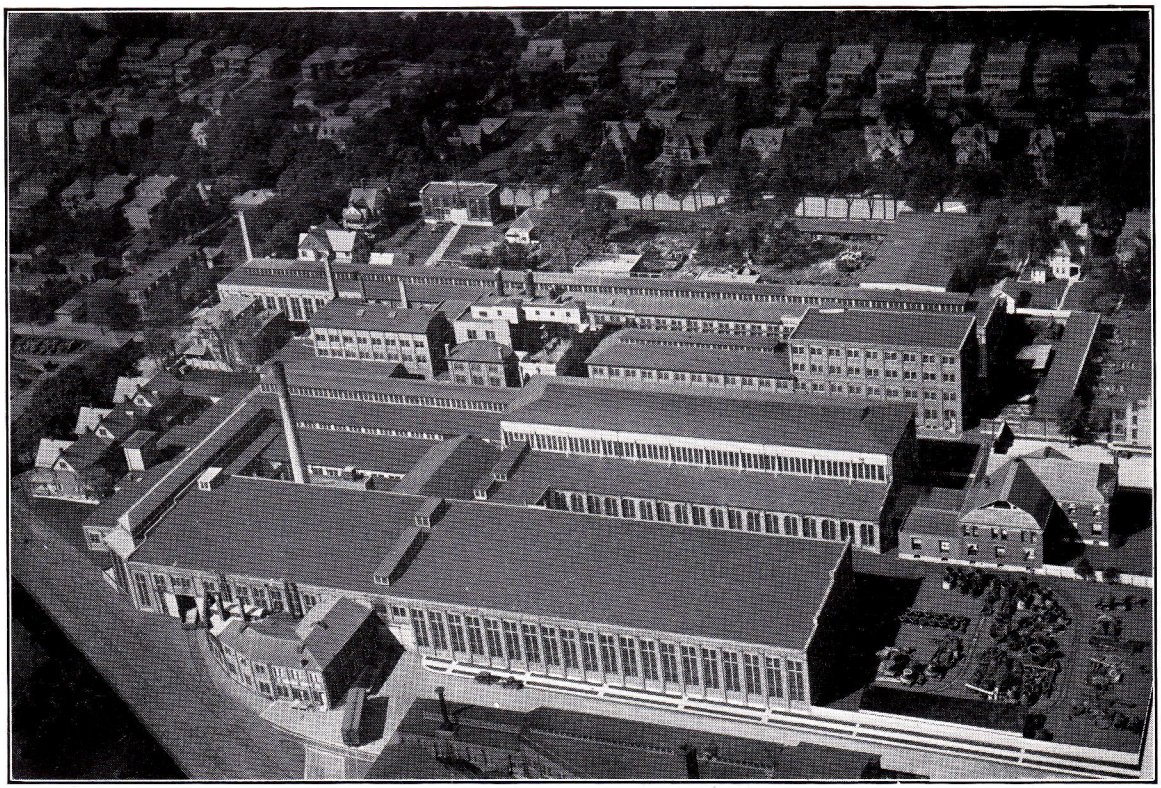


THE WORLD'S LARGEST HYDRAULIC TURBINE AND VALVE WORKS
WHERE ROTOVALVES ARE MADE

S. MORGAN SMITH COMPANY

ESTABLISHED 1877

Main Office and Works: YORK, PENNSYLVANIA

DISTRICT OFFICES

Boston, 176 Federal Street
Chicago, 20 N. Wacker Drive
Salt Lake City, 206 S. W. Temple Street
Portland, Ore., 224 Pine Street

Associated Company, S. Morgan Smith-Inglis Co., Ltd., 14 Strachan Avenue, Toronto, Canada

Foreword

GREAT strides are constantly being made in the development, design and perfection of Mechanical Equipment. Consistent with the S. MORGAN SMITH policy of striving to lead in perfection, this catalogue is prepared for use of ENGINEERS whose problems deal solely in the design and operation of valves for all services.

The ROTOVALVE described on the following pages of this catalogue is the result of careful study on the part of our Engineering Department, coupled with a wealth of data obtained from our well equipped Hydraulic Laboratory and field tests.

Past experience in the building of large size ROTARY and PLUG valves, together with years of experience in the design and building of Turbines, Valves, Gates and Hoists, assures us the ROTOVALVE is the last word in mechanical perfection and design.

ROTOVALVES are designed with many inherent advantages and have a very definite place in the field of liquid control.

Paramount in the ROTOVALVE design is its simplicity and neatness, making it a piece of equipment fitting for any modern pump or operating room floor.

S. MORGAN SMITH COMPANY,
York, Penna.

Standard Rotovalves

FOR

Air • Gas • Oil • Water Sewerage

MANUALLY, ELECTRICALLY or HYDRAULICALLY operated two way valves for working pressures of 125 or 250 lbs. In sizes 6″ to 48″ inclusive.

MANUALLY operated TWO WAY—THREE WAY—FOUR WAY—ELBOW and drilling valves in sizes 1″ and over for working pressures of 125—250—400—800 lbs.

FLANGED—SCREWED—HUB END VALVES are standard.

Rotovalves

Are particularly adaptable for installations as

WATER and SEWERAGE	ALTITUDE valves, PRESSURE REGULATOR valves, AUTOMATIC CHECK valves, STOP valves, FREE DISCHARGE valves.
AIR—GAS and OIL	AUTOMATIC CHECK valves, STOP valves, DRILLING valves, PRESSURE REGULATOR valves, PIPE LINE valves.

Inherent Advantages

Resultant through installation of ROTOVALVES

1. The most important consideration in any pumping installation is the loss of head which results in increased cost for power. The ROTOVALVE cuts this loss to a minimum since it has a flush passageway throughout its length equal to the full area of the pipe connection.

2. SURGES and WATER HAMMER are important factors in the operations of pipe lines or pumping stations and quite often become serious.

The advent of the centrifugal pump created a problem along these lines that had to be met. There are a few ways of handling this problem mechanically and among them the ROTOVALVE offers a very satisfactory solution.

In the ROTOVALVE the curve of area cut off throughout the full stroke of the plug assimilates a parabola, showing a decided slowing up of area cut off at the closing end of the stroke which materially reduces the intensity of the water hammer. This characteristic together with the flexible means of adjusting the timing of the opening and closing movements of the valve permits the elimination of serious surging in the pipe line.

3. Three point bearings permit the exact alignment of the valve plug and body at all times and lower the bending stresses, making for ease in operation. All bearings are thoroughly lubricated.

These features are additional assurance of a tight valve when seated. The mounting of the plug on its bearings permits throttling in any position without rattle or vibration.

4. All valves reseat in open position. This is only accomplished in the ROTOVALVE as of present day design. This is of particular advantage where liquids are carrying sludge as in sewerage work or for use in pumping stations on raw water, for oil or gas lines, or for pipe lines where valves are operated very seldom.

5. The valve seats are so located in the body that they do not come into the direct flow of the liquid, and, therefore, pitting, scouring or wire-drawing does not occur. The actual scrub or wear on the seats only occurs at time of plug seating or unseating.

6. ROTOVALVES can be operated very easily on unbalanced pressures without a by-pass, as the entire load is taken on the bearings after unseating.

7. ROTOVALVES may be throttled in any position without creeping open or closed from the position in which they are set.

8. ROTOVALVES are neat in appearance requiring considerably less space than most other types of valves.

They are entirely enclosed so that no foreign material can impair operation, and all internal working parts are fully lubricated. Friction of bearings and operating mechanism is reduced to a minimum.

9. Interchangeability of ROTOVALVE parts is of extreme importance and well worth considering when purchasing valves of this type.

10. ROTOVALVES are positive insurance against damage resulting from emergencies and are dependable when used as automatic check or control valves.

The Rotovalve

IN GENERAL

1. The basic design of the ROTOVALVE is not new as rotary valves first were used successfully in foreign countries many years ago. Plug and rotary valves have been used in this country with great success for the past six years.

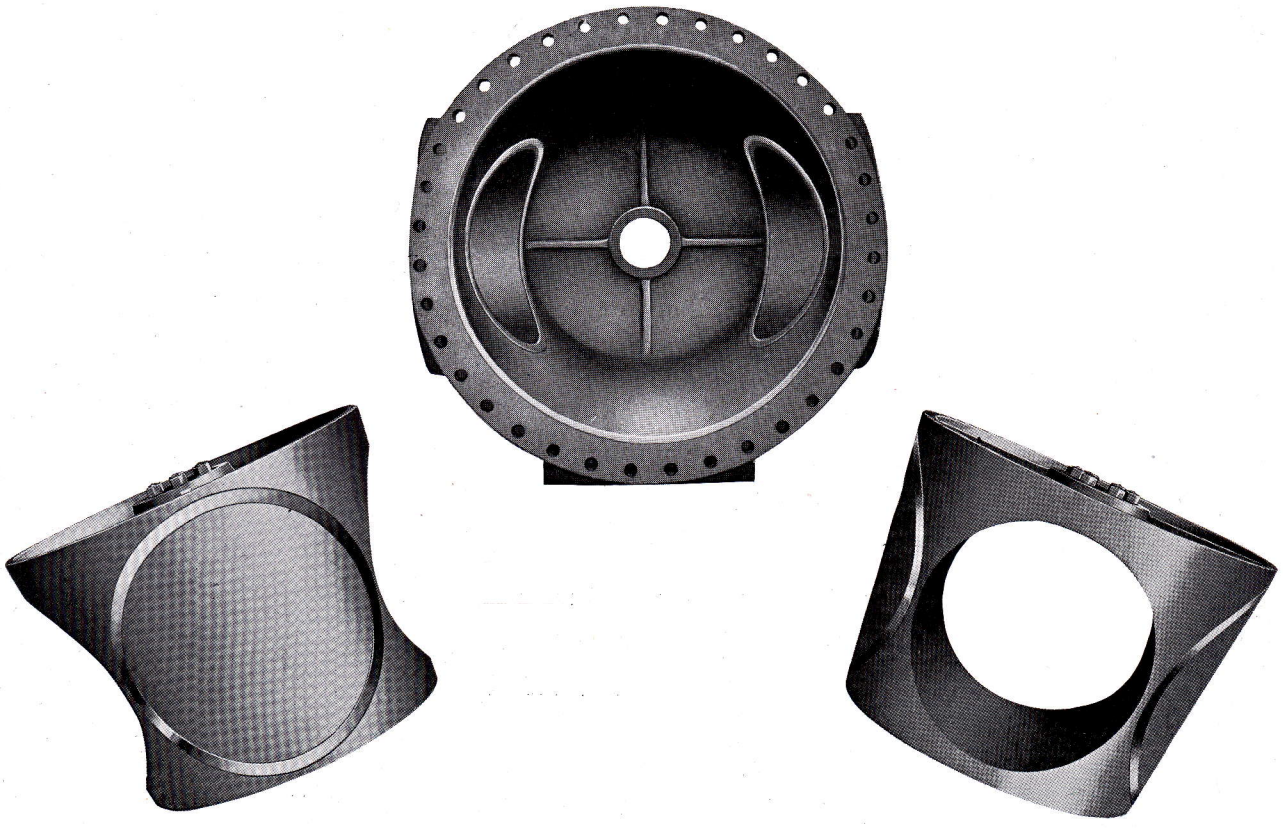
The ROTOVALVE however does offer new and novel means of operation. The operating mechanism is of very sturdy construction, well lubricated and protected from foreign matter. These factors result in superior ease and assurance in operation.

2. The main ROTOVALVE itself is used for all types of installations. By simply changing the controls, a valve may be used as a check valve, pressure regulating, altitude or stop valve.

3. All operating mechanism, bodies, plugs and controls are designed for their respective working pressures with ample factors of safety. In addition all working parts may be removed without removal of the valve body from the line.

4. All materials used are in accordance with the A.S.T.M. code for such practice.

5. All valves are designed to comply with the A.W.W.A. specifications for flanges or hub ends, and for working loads, testing and fitting.



Standard Body and Plug

For All Types of Rotovalves

The Body and Plug for all types of ROTOVALVES, as shown in the above views, are tapered. The Plug upon being relieved from its seated position, and rotated, becomes a surface of revolution within a surface of revolution.

It will be noted that the seats on the Plug are practically flush, while the seats in the Body are slightly raised.

The trunnion in the bottom of the Body is the mounting for the lower bearing upon which the Plug rotates after unseating, at which time the clearance between the Plug and Body Seats is enough to permit easy rotation, yet not enough to permit foreign matter getting past the seats and into the Body.

The Automatic Check Valve

The AUTOMATIC CHECK VALVE consists essentially of two parts, a standard ROTOVALVE, (which is used for all automatic installations) and a control valve, which may be either HYDRAULICALLY or ELECTRICALLY CONTROLLED.

The check valve is so designed that, where hydraulic control is used, it will open AUTOMATICALLY when the pump has built up its head (against a closed valve) equal to the head on the line side. It will close AUTOMATICALLY at any time the pump stops for any reason.

The control can be set so that the *opening time of the valve may be controlled independently of the closing time.*

This is of VITAL IMPORTANCE in the handling of SURGES and WATER HAMMER.

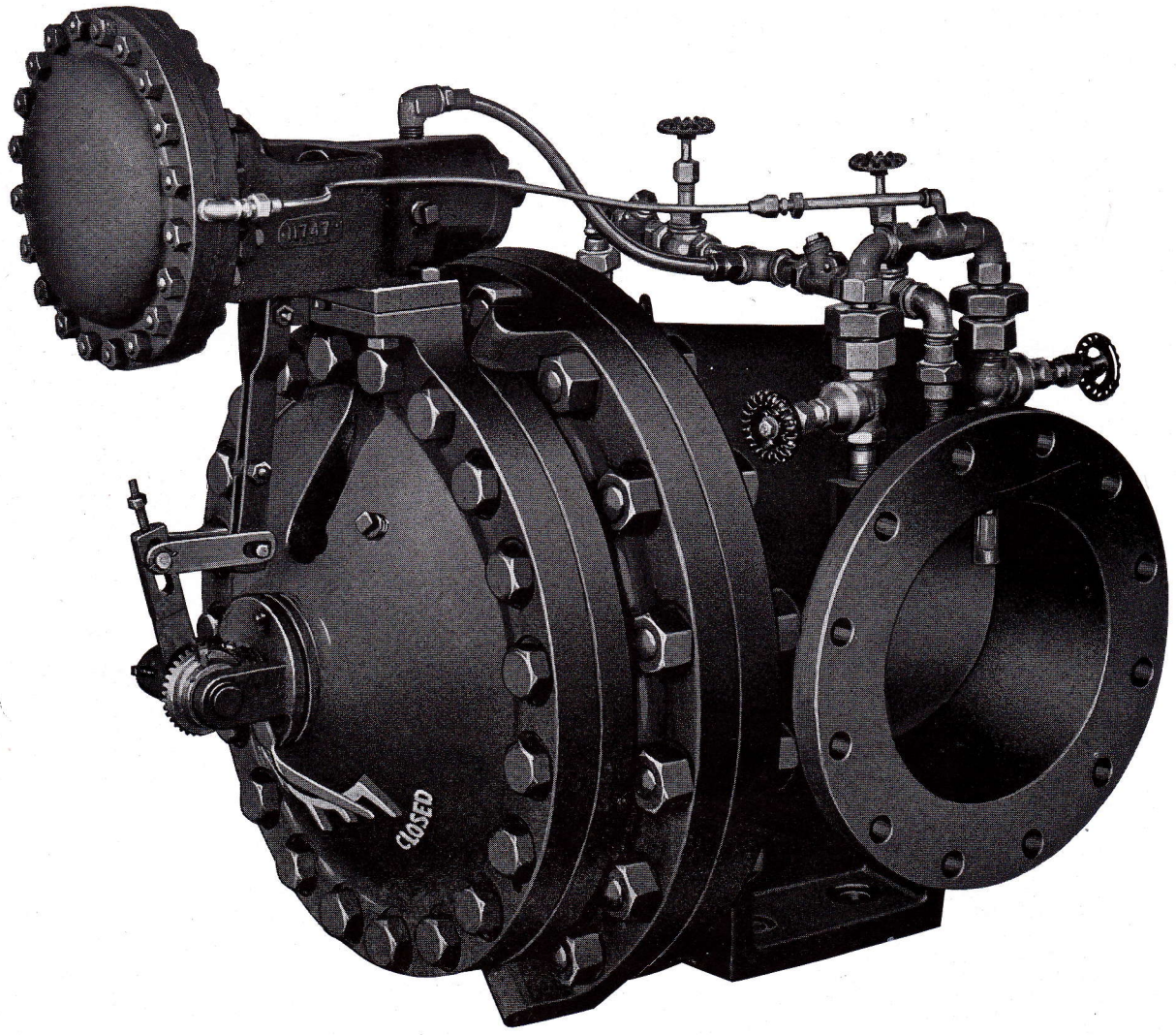
Hydraulically controlled check valves are used for clear water installations where the velocity through the valve is greater than 7 ft. per second. However, special applications are sometimes made with lower velocities.

Where low velocities, low pressures, or sewage are encountered it is recommended that Electrically controlled valves be selected. A clear water supply must be provided for operation. Electrically controlled valves should be used where extremely quick operating time is essential and where the pipe line inertia is low enough to permit.

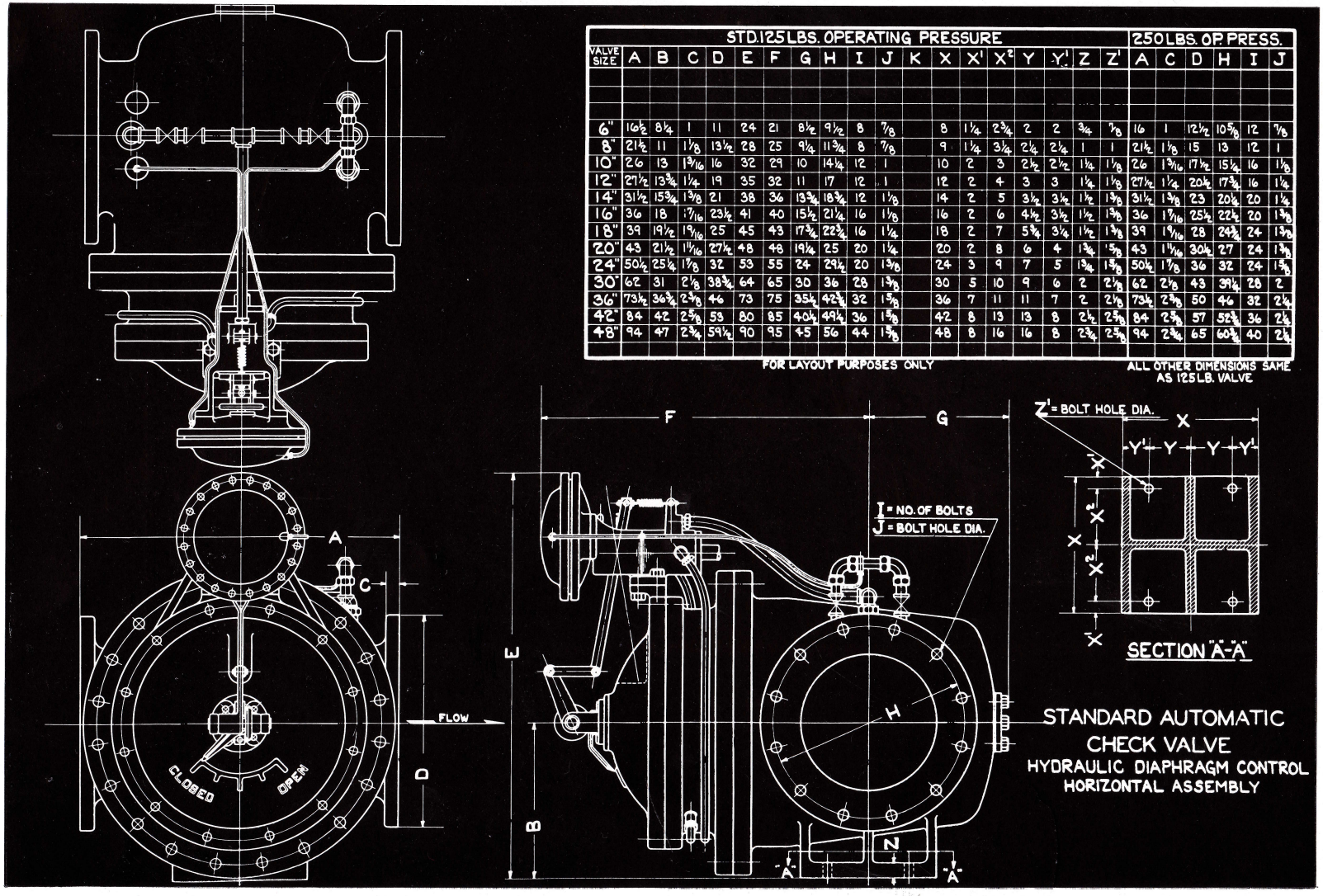
If the motor characteristics permit solenoid control, the time of starting the valve to move is appreciably less than for hydraulic control.

All CONTROLS, whether for check valves or other types of AUTOMATIC valves, are equipped with manual operating means independent of the automatic control.

Standard
Automatic Check Valve



Assembled with Hydraulic Control for Automatic Check Valve Use



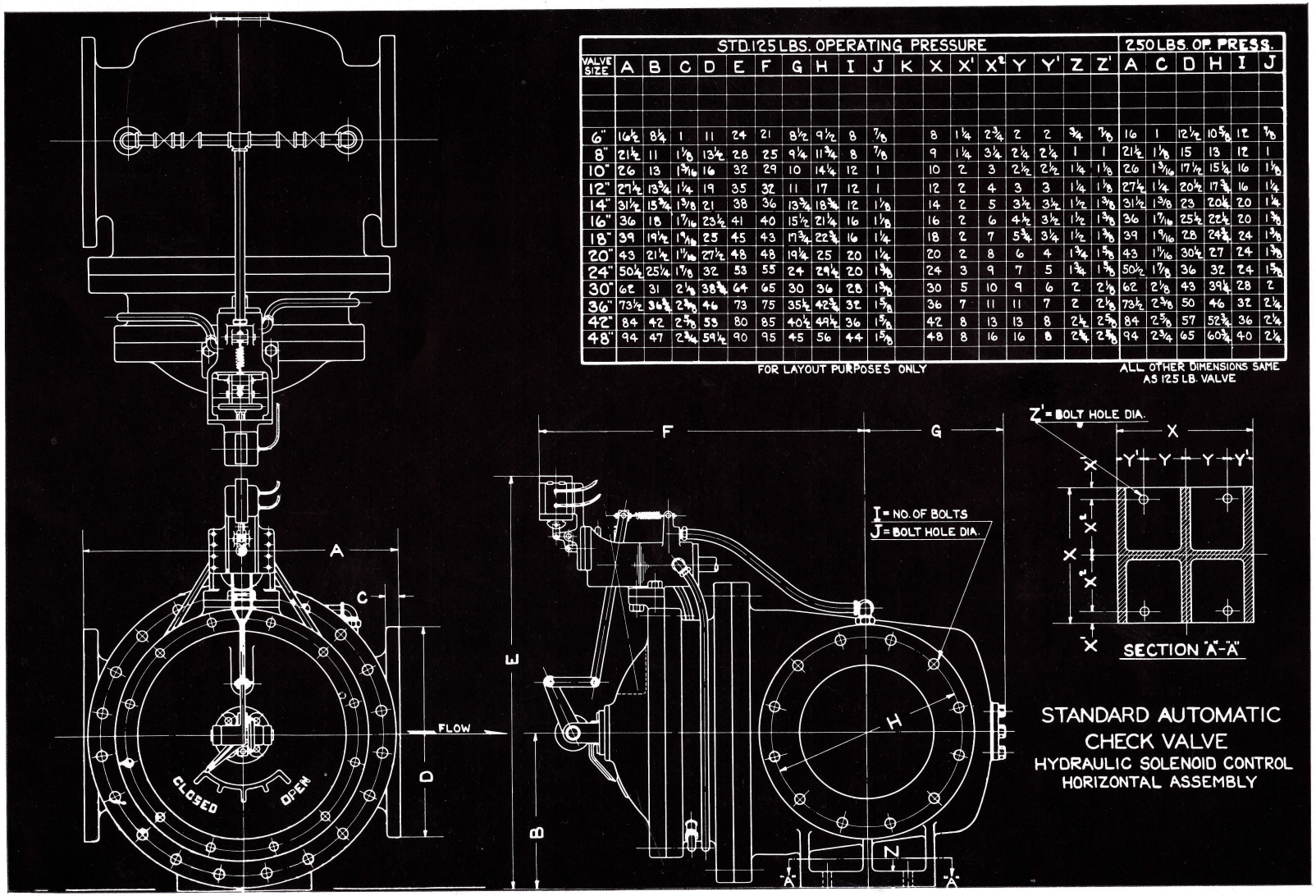
VALVE SIZE	STD. 125 LBS. OPERATING PRESSURE																		250 LBS. OP PRESS.					
	A	B	C	D	E	F	G	H	I	J	K	X	X'	X²	Y	Y'	Z	Z'	A	C	D	H	I	J
6"	10½	8¼	1	11	24	21	8½	9½	8	⅞		8	1¼	2¾	2	2	¾	⅜	16	1	12½	10⅝	12	⅞
8"	21½	11	1⅛	13½	28	25	9¼	11¾	8	⅞		9	1¼	3¼	2¼	2¼	1	1	21½	1⅛	15	13	12	1
10"	26	13	1 3/16	16	32	29	10	14¼	12	1		10	2	3	2½	2½	1¼	1⅛	26	1 3/16	17½	15¼	16	1⅛
12"	27½	13¾	1¼	19	35	32	11	17	12	1		12	2	4	3	3	1¼	1⅛	27½	1¼	20½	17¾	16	1¼
14"	31½	15¾	1⅜	21	38	36	13¾	18¾	12	1⅛		14	2	5	3½	3½	1½	1⅜	31½	1⅜	23	20⅛	20	1¼
16"	36	18	1 7/16	23½	41	40	15½	21¼	16	1⅛		16	2	6	4½	3½	1½	1⅜	36	1 7/16	25½	22½	20	1⅜
18"	39	19½	1 9/16	25	45	43	17¾	22¾	16	1¼		18	2	7	5¾	3¼	1½	1⅜	39	1 9/16	28	24¾	24	1⅜
20"	43	21½	1 11/16	27½	48	48	19¼	25	20	1¼		20	2	8	6	4	1¾	1⅝	43	1 11/16	30½	27	24	1⅜
24"	50½	25¼	1⅞	32	53	55	24	29½	20	1 3/8		24	3	9	7	5	1¾	1⅜	50½	1⅞	36	32	24	1⅝
30"	62	31	2⅛	38¾	64	65	30	36	28	1⅝		30	5	10	9	6	2	2⅛	62	2⅛	43	39¼	28	2
36"	73½	36¾	2⅜	46	73	75	35½	42⅜	32	1⅝		36	7	11	11	7	2	2⅛	73½	2⅜	50	46	32	2¼
42"	84	42	2⅝	53	80	85	40¼	49¼	36	1⅝		42	8	13	13	8	2⅛	2⅝	84	2⅝	57	52⅜	36	2¼
48"	94	47	2¾	59½	90	95	45	56	44	1⅝		48	8	16	16	8	2¾	2⅝	94	2¾	65	60⅜	40	2¼

FOR LAYOUT PURPOSES ONLY

ALL OTHER DIMENSIONS SAME AS 125 LB. VALVE

STANDARD AUTOMATIC CHECK VALVE

HYDRAULIC DIAPHRAGM CONTROL HORIZONTAL ASSEMBLY



VALVE SIZE	STD. 125 LBS. OPERATING PRESSURE																	250 LBS. OP. PRESS.					
	A	B	C	D	E	F	G	H	I	J	K	X	X'	X²	Y	Y'	Z	Z'	A	C	D	H	I	J
6"	16½	8¼	1	11	24	21	8½	9½	8	⅞		8	1¼	2¾	2	2	¾	⅞	16	1	12½	10⅝	12	⅞
8"	21½	11	1⅛	13½	28	25	9¼	11¾	8	⅞		9	1¼	3¼	2¼	2¼	1	1	21½	1⅛	15	13	12	1
10"	26	13	1⅜	16	32	29	10	14¼	12	1		10	2	3	2½	2½	1¼	1⅛	26	1 3/16	17½	15¼	16	1⅛
12"	27½	13¾	1¼	19	35	32	11	17	12	1		12	2	4	3	3	1¼	1⅛	27¼	1¼	20½	17¾	16	1¼
14"	31½	15¾	1⅜	21	38	36	13¾	18¾	12	1⅛		14	2	5	3½	3½	1½	1⅜	31½	1⅜	23	20¼	20	1¼
16"	36	18	1 7/16	23½	41	40	15½	21¼	16	1⅛		16	2	6	4½	3½	1½	1⅜	36	1 7/16	25½	22¼	20	1⅜
18"	39	19½	1 9/16	25	45	43	17¾	22¾	16	1¼		18	2	7	5¾	3¼	1½	1⅜	39	1 9/16	28	24¾	24	1⅜
20"	43	21½	1 11/16	27½	48	48	19¼	25	20	1¼		20	2	8	6	4	1¾	1⅝	43	1 11/16	30½	27	24	1⅜
24"	50½	25¼	1⅞	32	53	55	24	29½	20	1⅜		24	3	9	7	5	1¾	1⅝	50½	1⅞	36	32	24	1⅝
30"	62	31	2⅛	38¾	64	65	30	36	28	1⅝		30	5	10	9	6	2	2⅛	62	2⅛	43	39¼	28	2
36"	73½	36¾	2⅜	46	73	75	35½	42¾	32	1⅝		36	7	11	11	7	2	2⅛	73½	2⅜	50	46	32	2¼
42"	84	42	2⅝	53	80	85	40½	49½	36	1⅝		42	8	13	13	8	2⅛	2⅝	84	2⅝	57	52¾	36	2¼
48"	94	47	2¾	59½	90	95	45	56	44	1⅝		48	8	16	16	8	2⅛	2⅝	94	2¾	65	60¾	40	2¼

FOR LAYOUT PURPOSES ONLY

ALL OTHER DIMENSIONS SAME AS 125 LB. VALVE

STANDARD AUTOMATIC CHECK VALVE

HYDRAULIC SOLENOID CONTROL HORIZONTAL ASSEMBLY

Altitude • Pressure • Regulating
OR
Free Discharge Valves

THE ALTITUDE VALVE is designed for use in connection with elevated tanks having either single or double pipe systems or any installation where control of liquid level is required.

The controls are designed with a degree of sensitivity permitting regulation within 6″ of water.

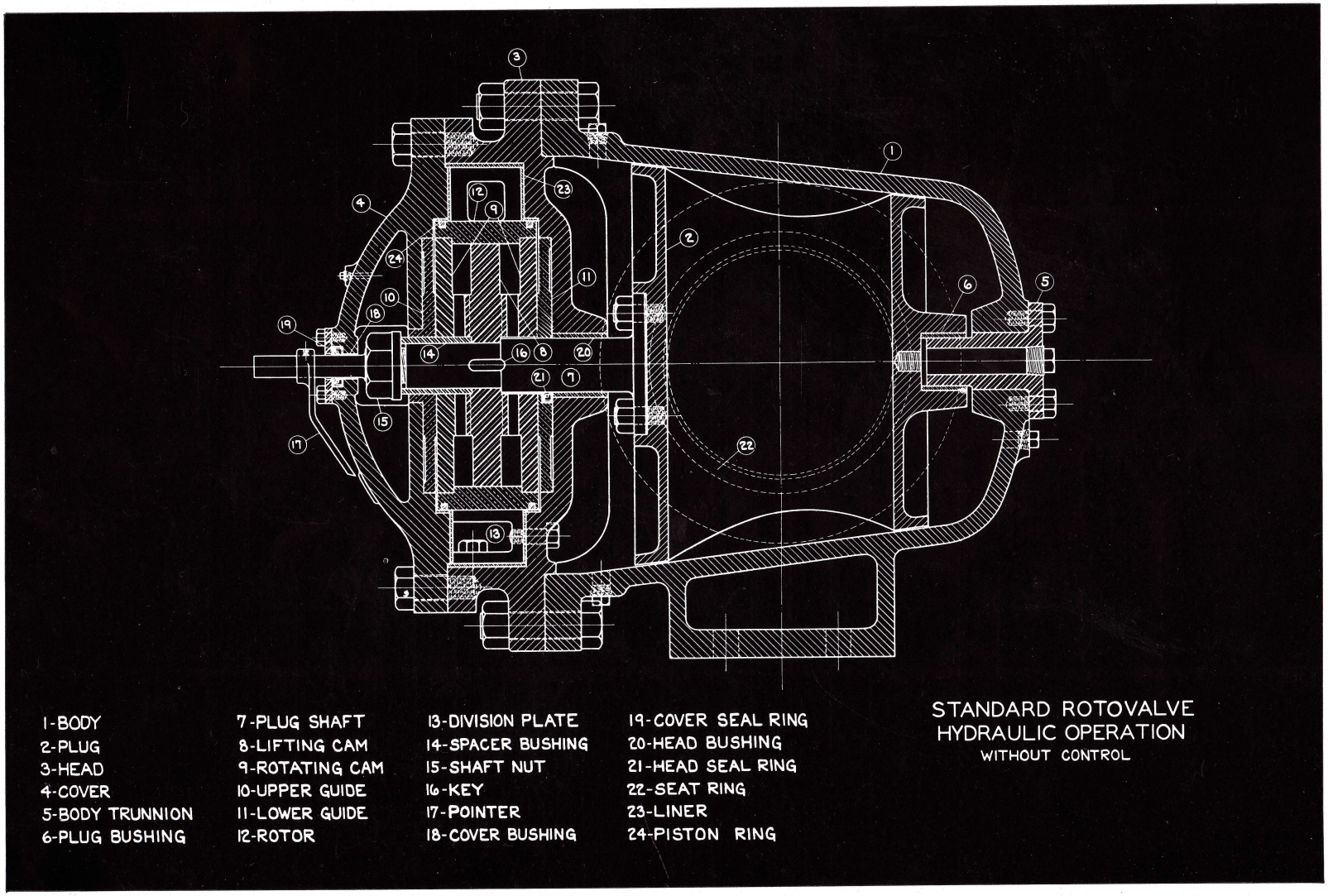
PRESSURE REGULATING VALVES are particularly useful in distribution systems, in cross connection between High and Low service systems or installations requiring a pressure differential.

FREE DISCHARGE VALVES—These valves are divided into two types.

A manually or hydraulically operated valve that is seated in the open or closed position only and recommended for use where the net head on the dam is less than 110 ft.

A Manually or Hydraulically operated valve that can be seated in any position having either dual hand wheels, or dual controls in the case of hydraulic operation. This type of free discharge valve is recommended for dams having net heads from 110 to 325 ft.

Insofar as the main valve is concerned its physical design is the same for all automatic or regulating types. By adding the proper control a standard Hydraulic ROTOVALVE can be made to function as a CHECK,—PRESSURE, REGULATING, or ALTITUDE VALVE.


1-BODY
2-PLUG
3-HEAD
4-COVER
5-BODY TRUNNION
6-PLUG BUSHING
7-PLUG SHAFT
8-LIFTING CAM
9-ROTATING CAM
10-UPPER GUIDE
11-LOWER GUIDE
12-ROTOR
13-DIVISION PLATE
14-SPACER BUSHING
15-SHAFT NUT
16-KEY
17-POINTER
18-COVER BUSHING
19-COVER SEAL RING
20-HEAD BUSHING
21-HEAD SEAL RING
22-SEAT RING
23-LINER
24-PISTON RING
STANDARD ROTOVALVE
HYDRAULIC OPERATION
WITHOUT CONTROL

Rotovalves For Sewerage
Air • Gas and Oil

The inherent advantages of ROTOVALVES as referred to on pages 4 and 5, are of particular importance where valves are used for sewerage AIR, GAS and OIL.

Various types of valves have been tried out for use on raw sewerage and it has been found that too frequently the seat rings and bonnets of the valves become clogged with solid matter. The ROTOVALVE offers a very satisfactory solution as liquid only gets in around the plug at the time the valve is rotating, and then must pass through a very small opening as the clearance between the plug and seats does not exceed twelve thousandths of an inch.

As explained before the plugs of ROTOVALVES are always seated when in either the open or closed positions, and it will be readily appreciated that this feature will eliminate the deposit of foreign materials at such locations as might tend to impair the operation of the valve.

For GAS and OIL lines it quite often becomes necessary to put a cleaner through the line to remove deposit on the inside of the pipe. The full circular opening through the valve makes it possible for the cleaner to pass through the valve without any possibility of sticking, or a valve having to be removed in order to allow the cleaner to pass.

The ease and time of operation during emergencies, together with the simplicity and ruggedness of design, makes the ROTOVALVE outstanding for this work.

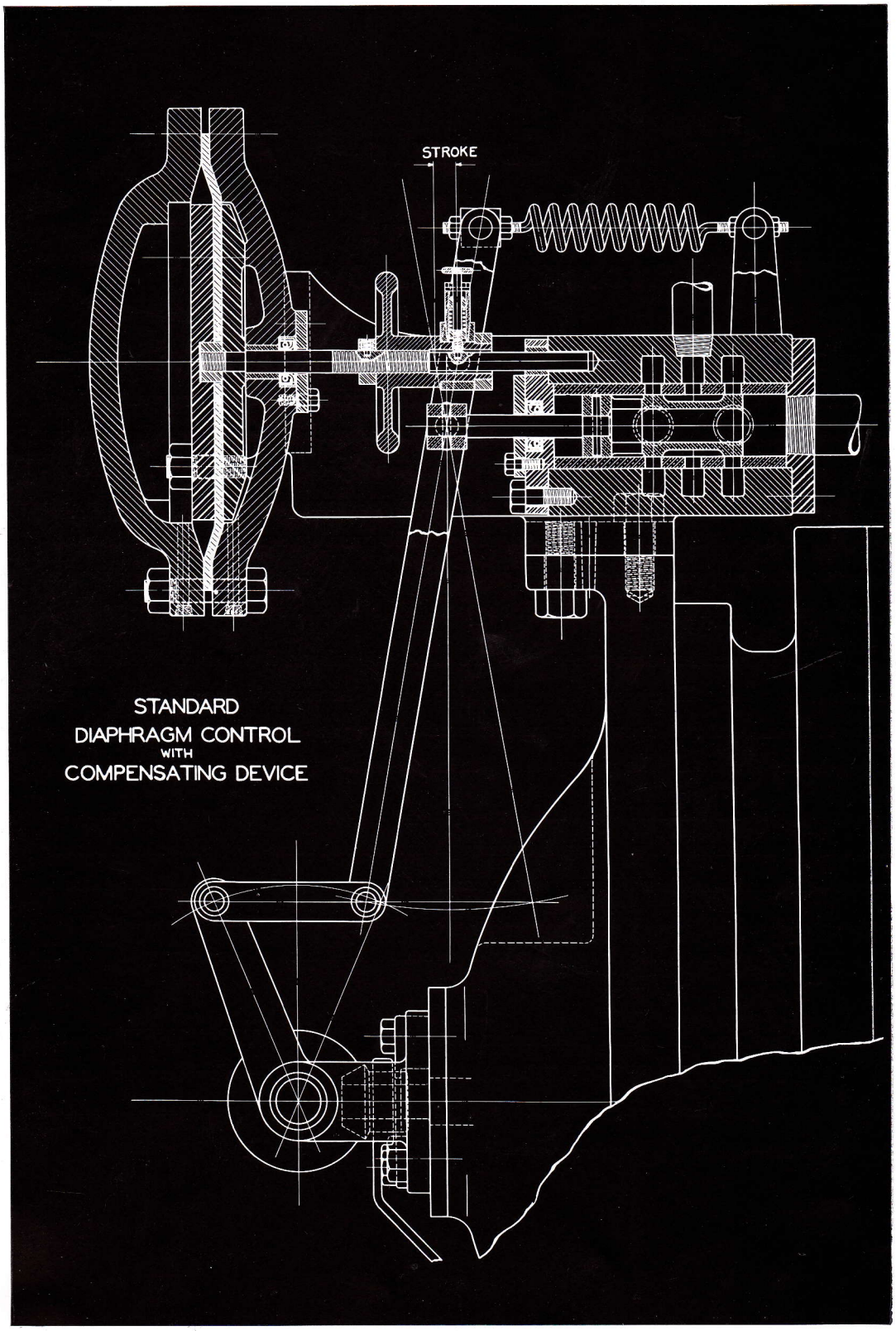
Controls
FOR
Automatic Rotovalves

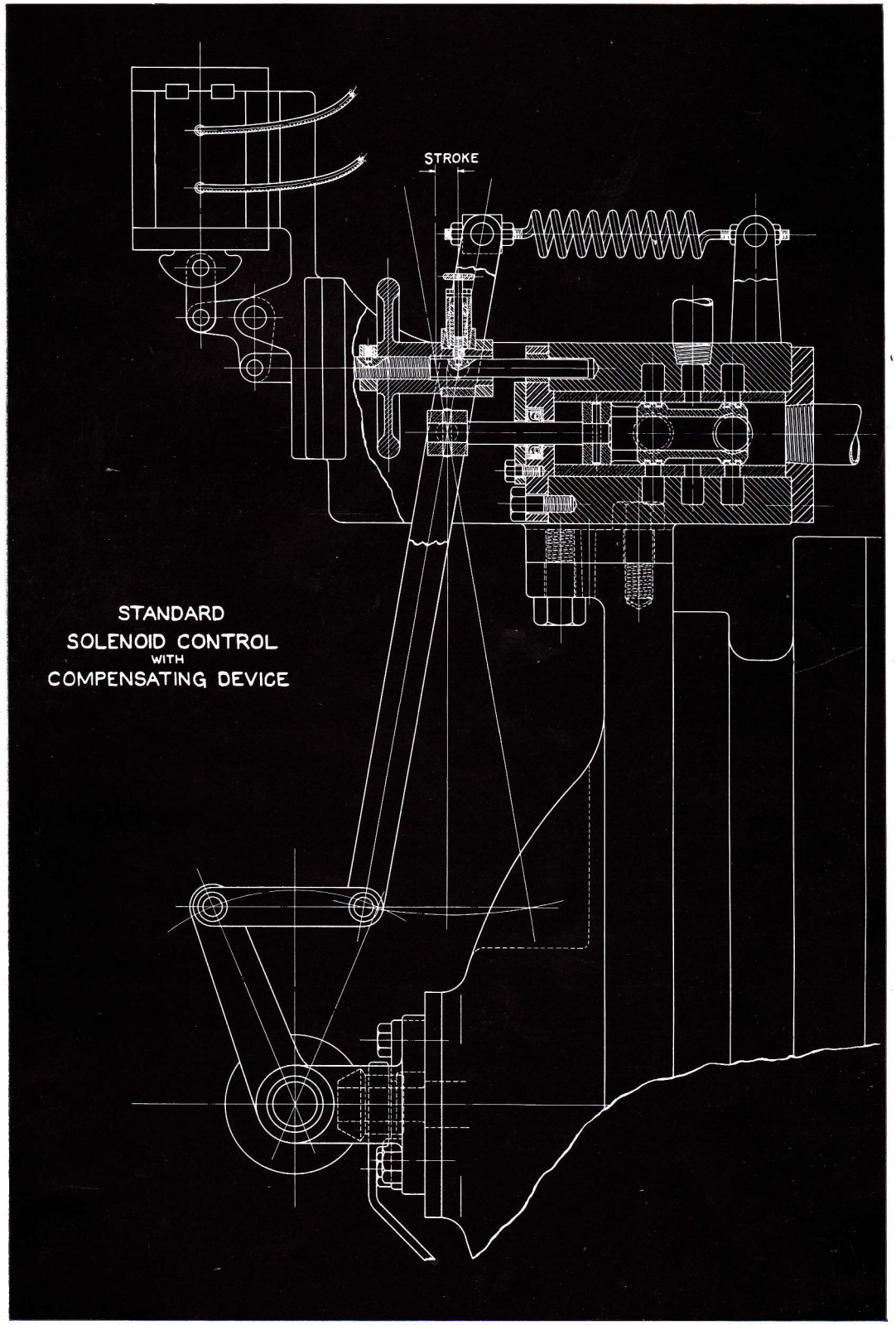
Various controls have been developed for the several applications in the Hydraulic field. The control itself consists of a piston type four-way valve. The piston movement being accomplished by direct connection to either a diaphragm or a solenoid. Where diaphragms are used the diaphragm chamber has a connection to each side of the diaphragm from a pressure connection on each side of the valve, and the starting or stopping of the pump raises or lowers the pressure on the proper side of the diaphragm, moving it into either the open or closed position in accordance with the pumping condition.

Where solenoid operated controls are used the solenoid would be hooked up according to the Electrical characteristics, and in such a manner as would cause the solenoid to energize at the time the pump was starting up, and to de-energize at any time the pump should shut down.

All types of automatic controls are equipped with a restoring mechanism. A diaphragm or solenoid moving the main piston of the four-way valve into either open or closed position will cause the main valve to move either open or closed, and the restoring mechanism will move the piston of the control valve back into the neutral position, sealing all ports, preventing leakage and creeping after the cycle of operation is complete.

Controls have been developed for use with AUTOMATIC CHECK valves, ALTITUDE and PRESSURE REGULATING valves, and for any service where automatic operation is dependent upon pressure, flow or displacement, and for working pressures of 125 or 250 lbs.


STROKE
STANDARD
DIAPHRAGM CONTROL
WITH
COMPENSATING DEVICE


STROKE
STANDARD
SOLENOID CONTROL
WITH
COMPENSATING DEVICE

Motor Operated Rotovalves

A complete line of motor operated ROTOVALVES has been developed for use on installations where the Engineer prefers this type of valve.

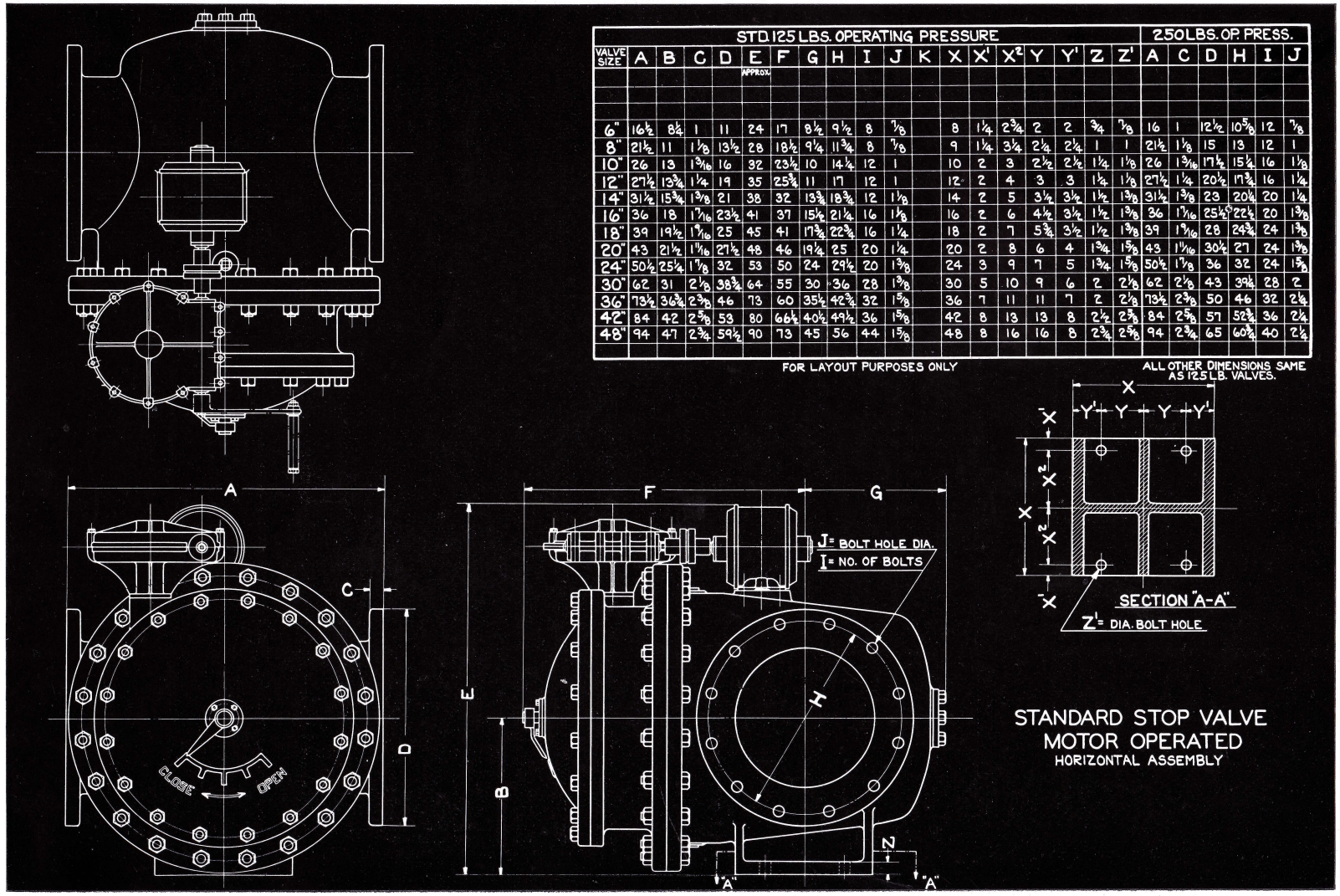
This line of valves may be equipped for either A.C. or D.C. motors and can be sold complete with the motors, limit switches, and contactors fully assembled.

Signal lights, position indicators or remote control stations can also be furnished.

When requesting information on motor operated valves, kindly furnish all of the electrical characteristics, time of operation required and specify what appurtenances if any are to be furnished by us.

The dimensional drawing, page nineteen, shows a standard ROTOVALVE, motor operated and assembled for horizontal installation.

Motor operated valves can be furnished for any working pressure, with flange or bell end connections as desired. This line of valves is particularly adaptable for installations where the valves may be inaccessible and it is desired to operate a series of valves from a central control station by remote push button control.



VALVE SIZE	STD. 125 LBS. OPERATING PRESSURE																		250 LBS. OP. PRESS.					
	A	B	C	D	E APPROX.	F	G	H	I	J	K	X	X'	X²	Y	Y'	Z	Z'	A	C	D	H	I	J
6"	16½	8¼	1	11	24	17	8½	9½	8	⅞		8	1¼	2¾	2	2	¾	⅞	16	1	12½	10⅝	12	⅞
8"	21½	11	1⅛	13½	28	18½	9¼	11¾	8	⅞		9	1¼	3¼	2¼	2¼	1	1	21½	1⅛	15	13	12	1
10"	26	13	1 3/16	16	32	23½	10	14¼	12	1		10	2	3	2½	2½	1¼	1⅛	26	1 3/16	17¼	15¼	16	1⅛
12"	27½	13¾	1¼	19	35	25¾	11	17	12	1		12	2	4	3	3	1¼	1⅛	27½	1¼	20½	17¾	16	1¼
14"	31½	15¾	1⅜	21	38	32	13⅜	18¾	12	1⅛		14	2	5	3½	3½	1½	1⅜	31½	1⅜	23	20¼	20	1¼
16"	36	18	1 7/16	23½	41	37	15¼	21¼	16	1⅜		16	2	6	4½	3½	1½	1⅜	36	1 7/16	25½	22¾	20	1⅜
18"	39	19½	1 7/16	25	45	41	17⅜	22¾	16	1¼		18	2	7	5⅜	3½	1½	1⅜	39	1 7/16	28	24¾	24	1⅜
20"	43	21½	1 11/16	27½	48	46	19¼	25	20	1¼		20	2	8	6	4	1¾	1⅝	43	1 11/16	30½	27	24	1⅜
24"	50½	25¼	1 7/8	32	53	50	24	29½	20	1⅜		24	3	9	7	5	1¾	1⅝	50½	1 7/8	36	32	24	1⅝
30"	62	31	2⅛	38¾	64	55	30	36	28	1⅜		30	5	10	9	6	2	2⅛	62	2⅛	43	39¾	28	2
36"	73½	36¾	2⅜	46	73	60	35¼	42¾	32	1⅝		36	7	11	11	7	2	2⅛	73½	2⅜	50	46	32	2¼
42"	84	42	2⅝	53	80	66½	40½	49½	36	1⅝		42	8	13	13	8	2½	2⅜	84	2⅝	57	52¾	36	2¼
48"	94	47	2¾	59½	90	73	45	56	44	1⅝		48	8	16	16	8	2¾	2⅝	94	2¾	65	60¾	40	2¼

FOR LAYOUT PURPOSES ONLY

ALL OTHER DIMENSIONS SAME AS 125 LB. VALVES.

STANDARD STOP VALVE
MOTOR OPERATED
HORIZONTAL ASSEMBLY

Operating Control Stands
FOR
Automatic or Hydraulic Rotovalve

OPERATING STANDS for all types of controls have been developed for installations where the valves may be located at inaccessible points, and where it may be desired to have an OPERATING STAND with a control convenient to the Operator.

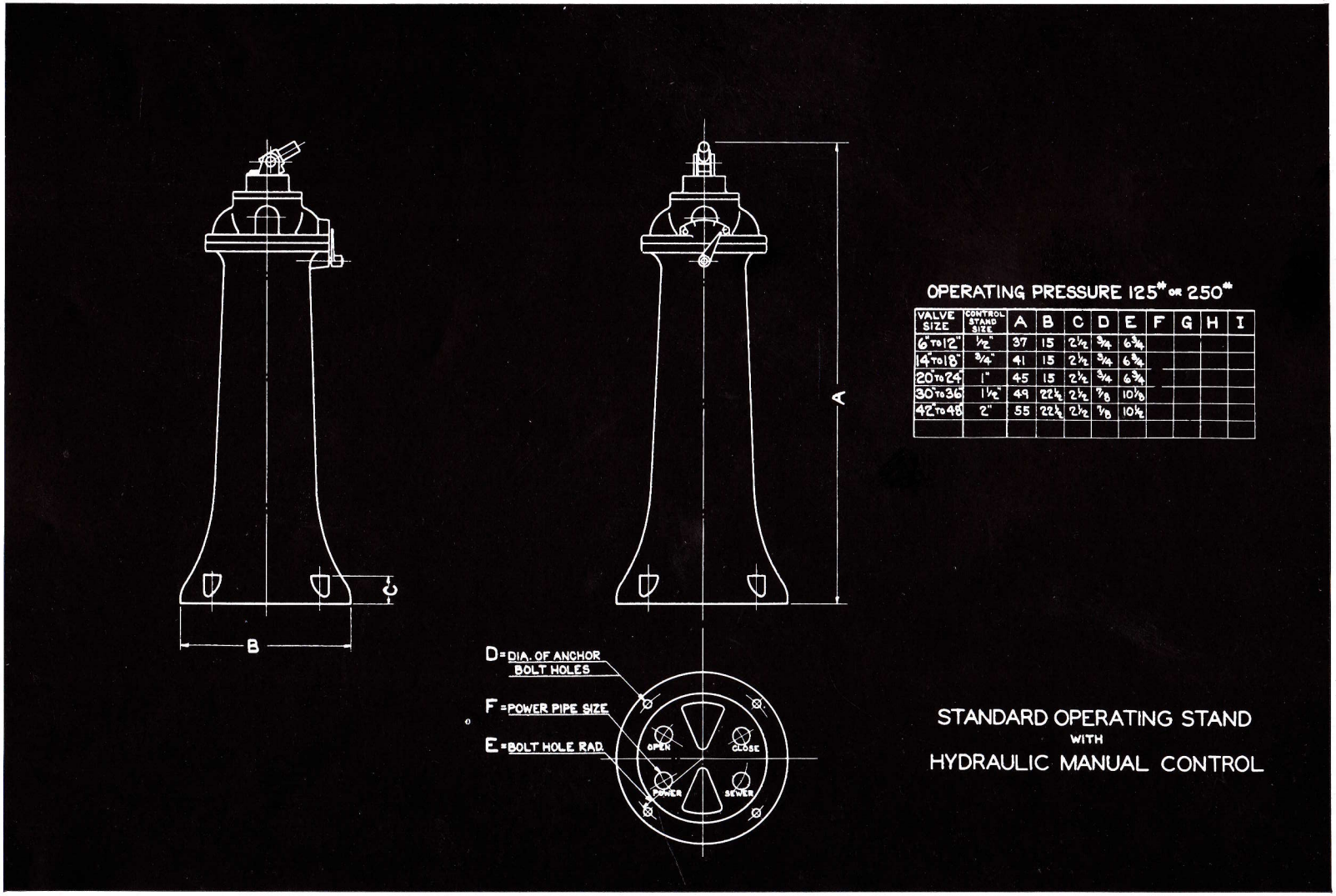
Drawings of HYDRAULIC DIAPHRAGM and SOLENOID CONTROLS are shown fully mounted on Floor Stands.

The drawings in this catalog will show the assembly and dimensions of the various types of controls and stands, and it will be noted that in addition to the Diaphragm Control and the Solenoid Control Mounting, there is a Standard Manual Hydraulic Mounting. This is for use in connection with Hydraulic valves when used as stop valves only, and the control shown on the Floor Stand is a four-way valve manually operated.

These Floor Stands are developed for 125 and 250 lbs. working pressures, and all Operating Stands are equipped with valve position indicators unless otherwise specified.

All piping and connections to the controls through the Floor Stands are concealed and the control piping is equipped with suitable connections beneath the floor for making up the control lines.

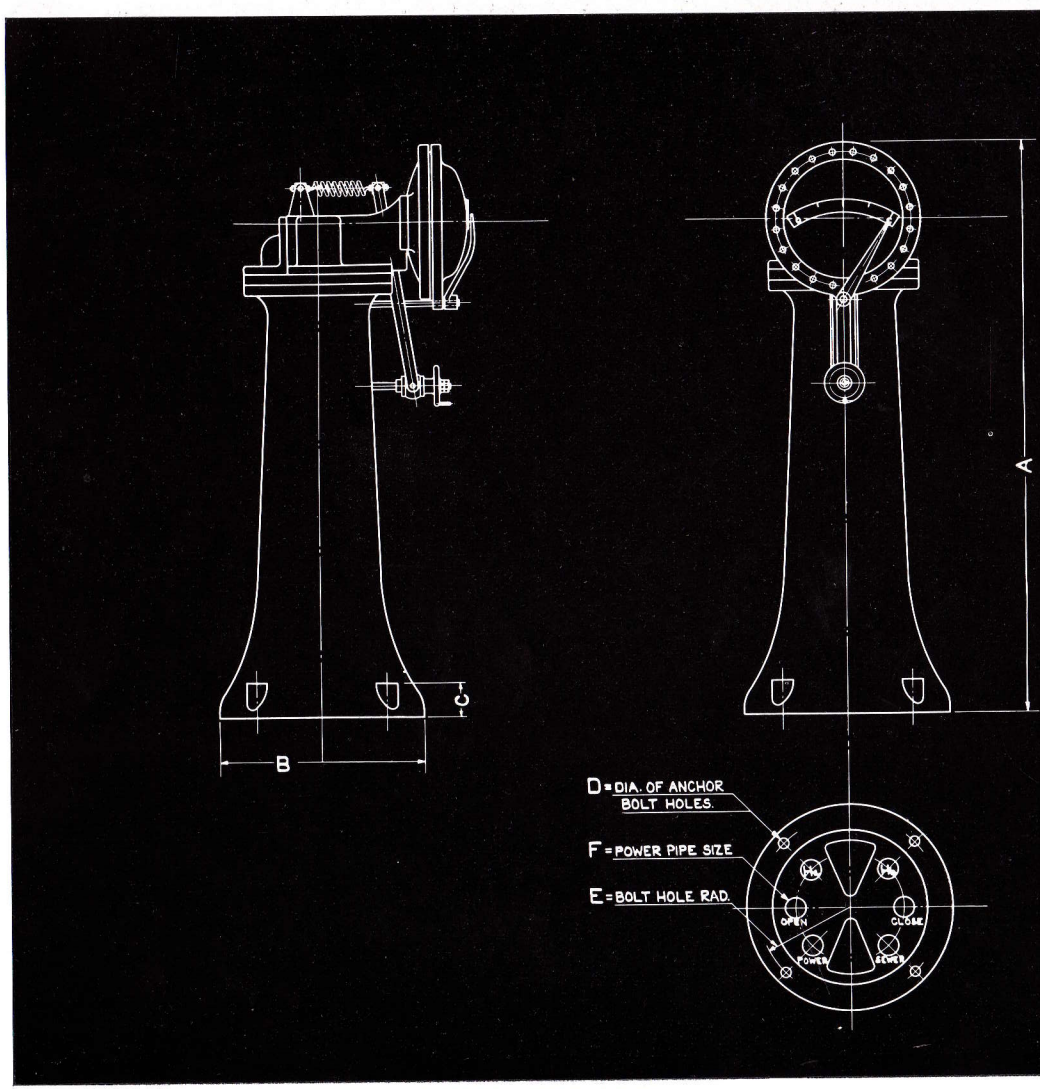
No piping beyond the floor stand connections is furnished unless otherwise specified. However, union fittings on control pipes are furnished complete.



OPERATING PRESSURE 125# or 250#

VALVE SIZE	CONTROL STAND SIZE	A	B	C	D	E	F	G	H	I
6" TO 12"	1/2"	37	15	2 1/2	3/4	6 3/4				
14" TO 18"	3/4"	41	15	2 1/2	3/4	6 3/4				
20" TO 24"	1"	45	15	2 1/2	3/4	6 3/4				
30" TO 36"	1 1/2"	49	22 1/2	2 1/2	7/8	10 1/8				
42" TO 48"	2"	55	22 1/2	2 1/2	1/8	10 1/2				

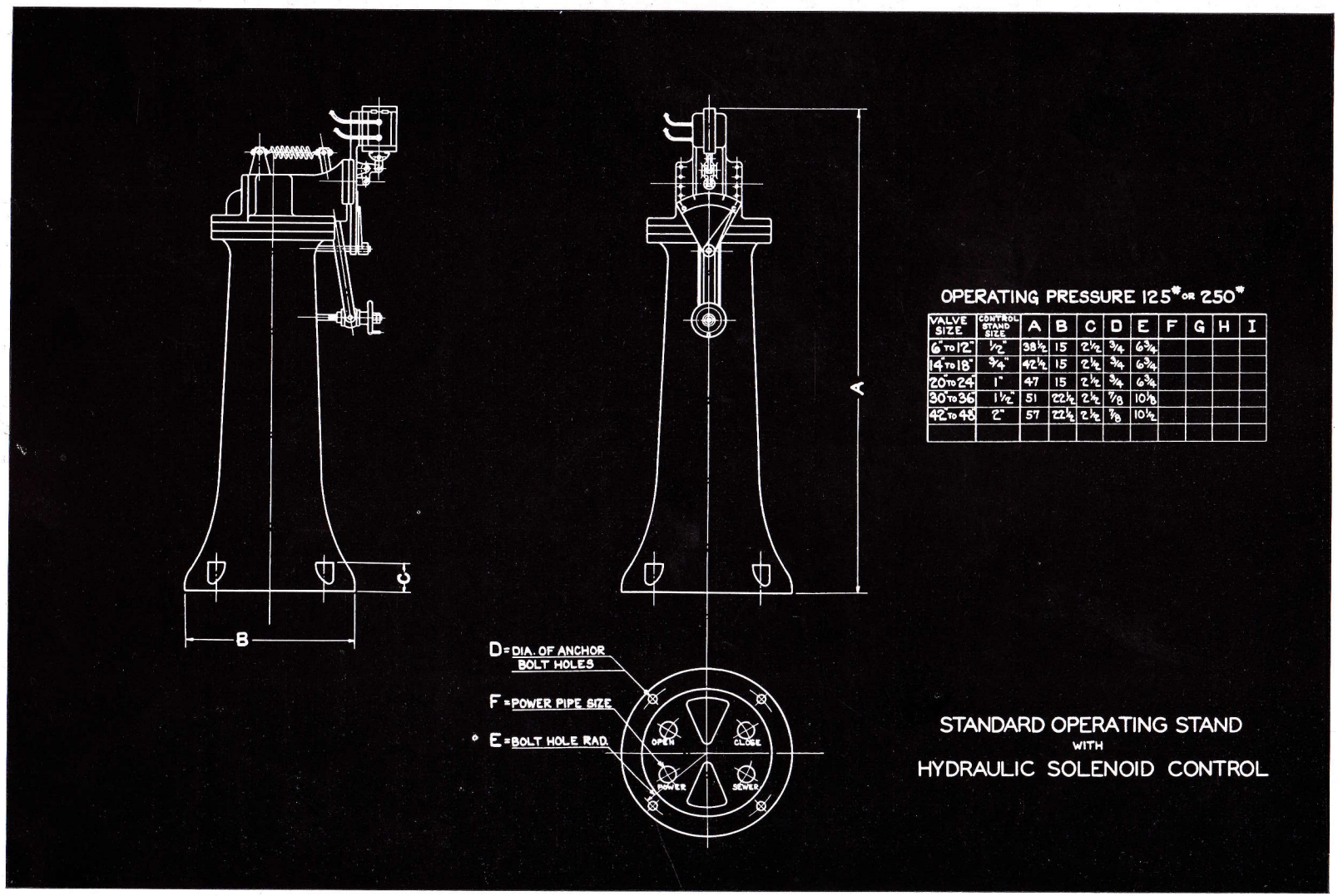
STANDARD OPERATING STAND
WITH
HYDRAULIC MANUAL CONTROL



OPERATING PRESSURE 125# OR 250#

VALVE SIZE	CONTROL STAND SIZE	A	B	C	D	E	F	G	H	I
6" TO 12"	1/2"	38 1/2	15	2 1/2	3/4	6 3/4				
14" TO 18"	3/4"	42 1/2	15	2 1/2	3/4	6 3/4				
20" TO 24"	1"	47	15	2 1/2	3/4	6 3/4				
30" TO 36"	1 1/2"	51	22 1/2	2 1/2	7/8	10 1/2				
42" TO 48"	2"	57	22 1/2	2 1/2	7/8	10 1/2				

STANDARD OPERATING STAND
WITH
HYDRAULIC AUTOMATIC CONTROL



OPERATING PRESSURE 125# OR 250#

VALVE SIZE	CONTROL STAND SIZE	A	B	C	D	E	F	G	H	I
6" TO 12"	½"	38½	15	2½	¾	6¾				
14" TO 18"	¾"	42½	15	2½	¾	6¾				
20" TO 24"	1"	47	15	2½	¾	6¾				
30" TO 36"	1½"	51	22½	2½	⅞	10⅛				
42" TO 48"	2"	57	22½	2½	⅞	10½				

STANDARD OPERATING STAND
WITH
HYDRAULIC SOLENOID CONTROL

Standard
Manual Rotovalves

The standard manual ROTOVALVE, a photograph of which is shown on the opposite page, is extremely practical under many conditions.

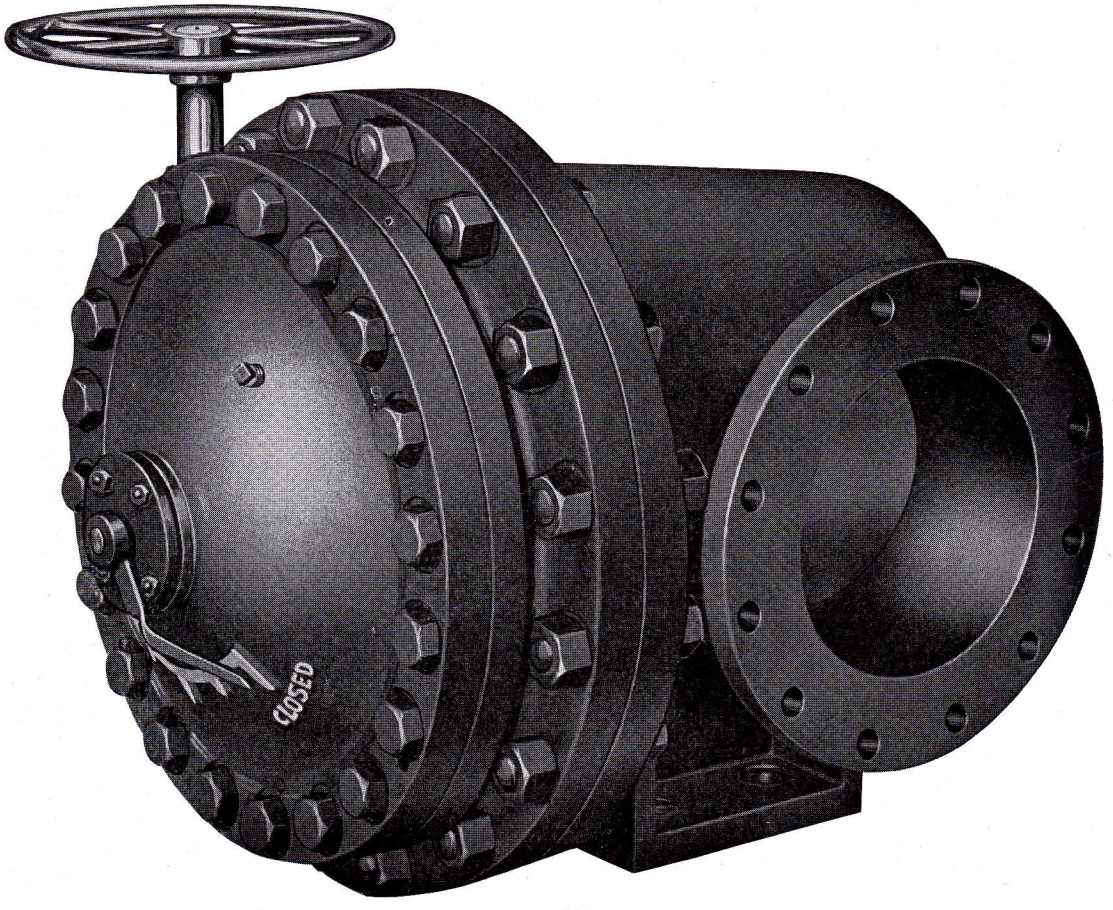
The time and effort necessary to operate a manual ROTOVALVE is very slight in comparison to other types of valves such as gate valves, etc. This makes the ROTOVALVE well worth considering for installation at strategic points in a distribution system where a quick closing valve, in case of a serious pipe line break, would save considerable damage and expense.

Many cases will warrant the using of this type of valve in place of motor operated gate valves. We recommend the use of these valves, especially in connection with sewerage work or for installations in Air, Gas or Oil pipe lines.

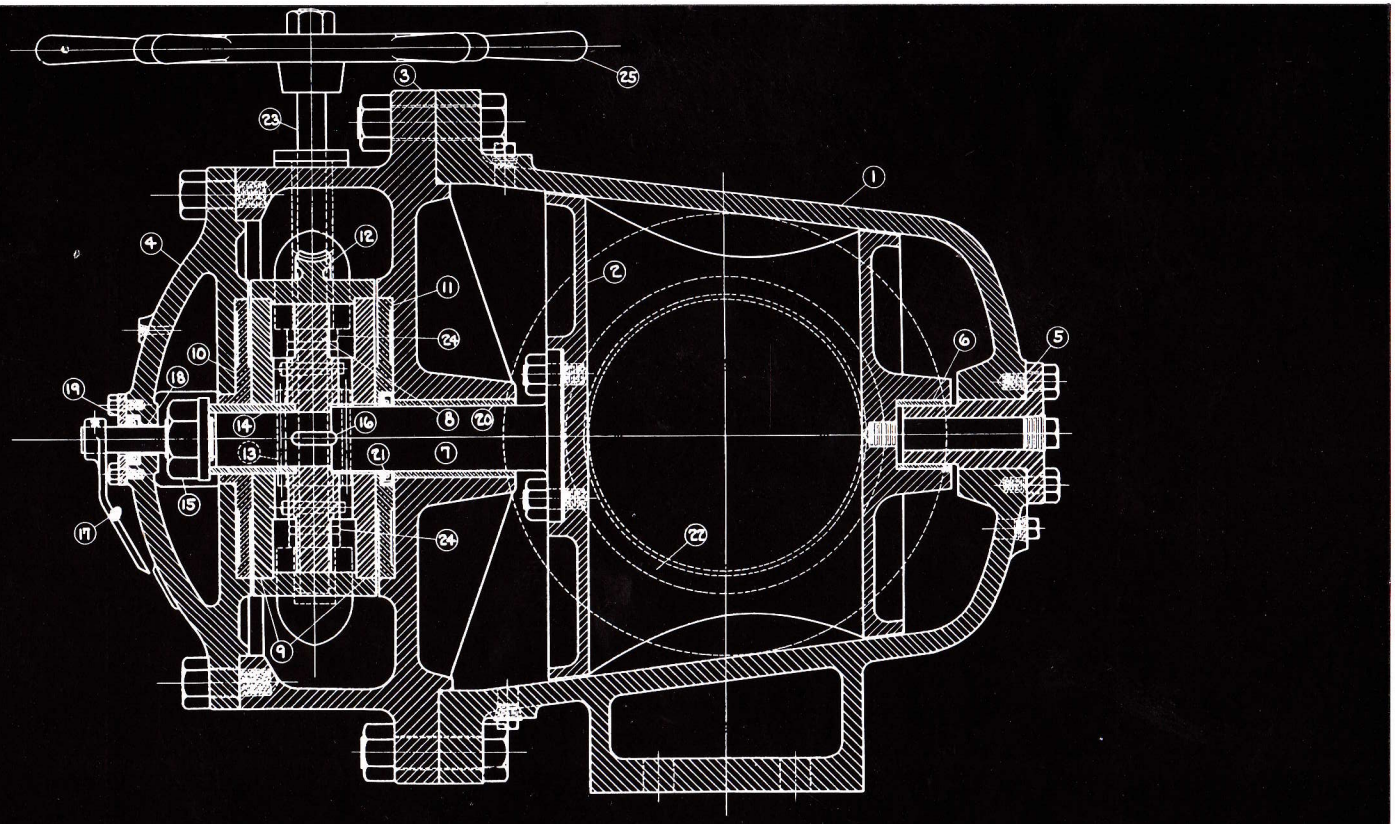
Inasmuch as all working parts are fully enclosed and lubricated, these types of valves can be installed under the most severe conditions without endangering the operating mechanism.

Manual ROTOVALVES can be furnished assembled for either horizontal or vertical mounting, and where it may be necessary the hand wheels or gear boxes may be mounted on operating stands with direct connection to the valve. In cases where Manual Valves are located in pits, etc., for operation by wrench, operating shaft nuts will be supplied according to the customer's standard.

Standard
Manual Rotovalve

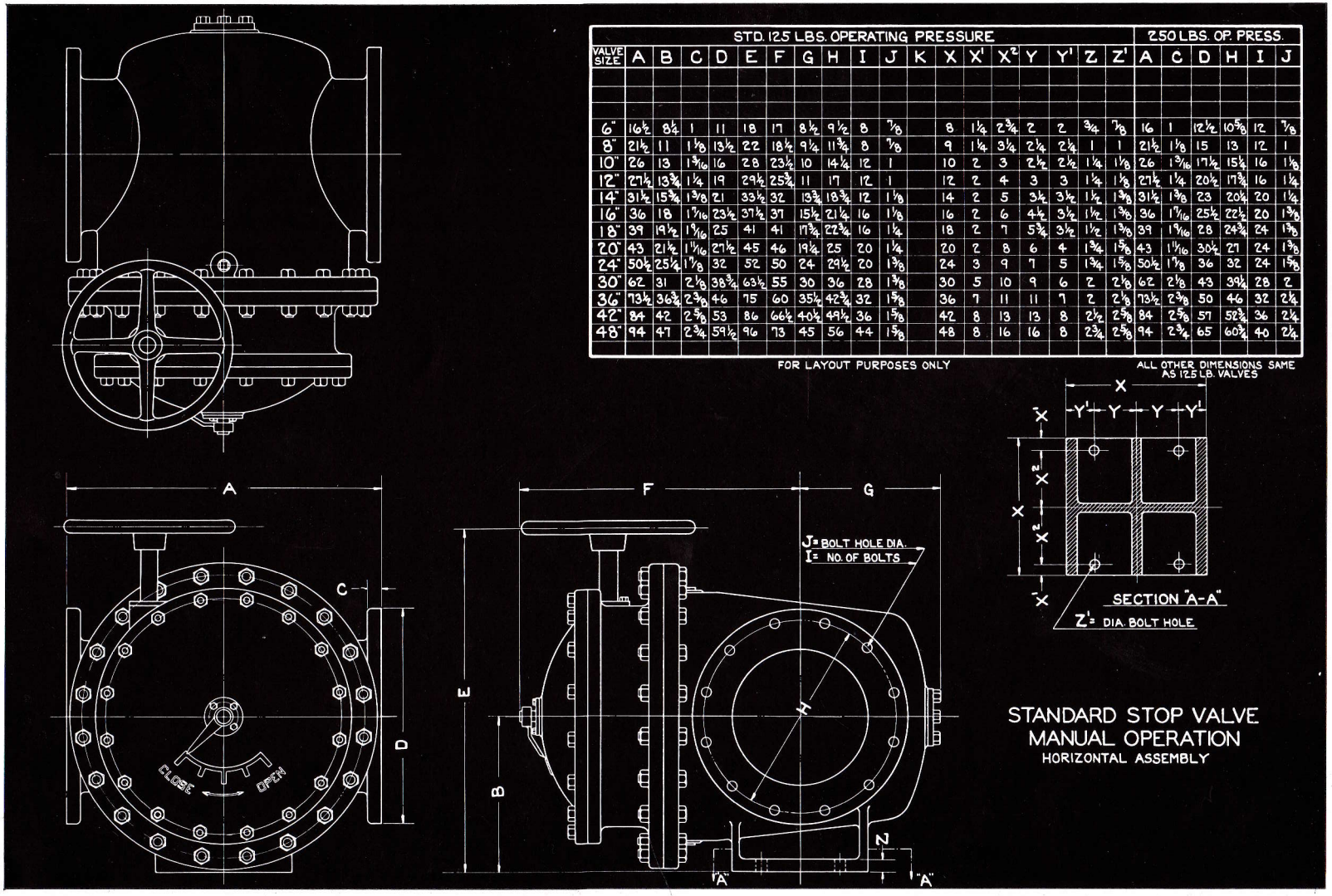


Valve Shown in Closed Position. Horizontal Assembly



1-BODY
2-PLUG
3-HEAD
4-COVER
5-BODY TRUNNION
6-PLUG BUSHING
7-PLUG SHAFT
8-LIFTING CAM
9-ROTATING CAM
10-UPPER GUIDE
11-LOWER GUIDE
12-WORM SECTOR
13-WORM
14-SPACER BUSHING
15-SHAFT NUT
16-KEY
17-POINTER
18-COVER BUSHING
19-COVER SEAL RING
20-HEAD BUSHING
21-HEAD SEAL RING
22-SEAT RING
23-WORM SHAFT
24-BALL THRUST BEARING
25-HANDWHEEL

STANDARD ROTOVALVE
MANUAL OPERATION



VALVE SIZE	STD. 125 LBS. OPERATING PRESSURE																		250 LBS. OP. PRESS.					
	A	B	C	D	E	F	G	H	I	J	K	X	X'	X²	Y	Y'	Z	Z'	A	C	D	H	I	J
6"	16½	8¼	1	11	18	17	8½	9½	8	⅞		8	1¼	2¾	2	2	¾	⅞	16	1	12½	10⅝	12	⅞
8"	21½	11	1⅛	13½	22	18½	9¼	11¾	8	⅞		9	1¼	3¼	2¼	2¼	1	1	21½	1⅛	15	13	12	1
10"	26	13	1⅜	16	28	23½	10	14¼	12	1		10	2	3	2½	2½	1¼	1⅛	26	1 3/16	17½	15¼	16	1⅛
12"	27½	13¾	1¼	19	29½	25¾	11	17	12	1		12	2	4	3	3	1¼	1⅛	27½	1¼	20½	17⅜	16	1¼
14"	31½	15¾	1⅜	21	33½	32	13⅜	18¾	12	1⅛		14	2	5	3½	3½	1½	1⅜	31½	1⅜	23	20½	20	1¼
16"	36	18	1 11/16	23½	37½	31	15½	21¼	16	1⅛		16	2	6	4½	3½	1½	1⅜	36	1 7/16	25½	22½	20	1⅜
18"	39	19½	1 9/16	25	41	41	17¾	22¾	16	1¼		18	2	7	5¾	3½	1½	1⅜	39	1 9/16	28	24¾	24	1⅜
20"	43	21½	1 11/16	27½	45	46	19¼	25	20	1¼		20	2	8	6	4	1¾	1⅝	43	1 11/16	30½	27	24	1⅜
24"	50½	25¼	1⅞	32	52	50	24	29½	20	1⅜		24	3	9	7	5	1¾	1⅝	50½	1⅞	36	32	24	1⅝
30"	62	31	2⅛	38¾	63½	55	30	36	28	1⅜		30	5	10	9	6	2	2⅛	62	2⅛	43	39¼	28	2
36"	73½	36¾	2⅜	46	75	60	35½	42¾	32	1⅝		36	7	11	11	7	2	2⅛	73½	2⅜	50	46	32	2¼
42"	84	42	2⅝	53	86	66½	40½	49½	36	1⅝		42	8	13	13	8	2½	2⅝	84	2⅝	57	52⅜	36	2¼
48"	94	47	2¾	59½	96	73	45	56	44	1⅝		48	8	16	16	8	2¾	2⅝	94	2¾	65	60¾	40	2¼

FOR LAYOUT PURPOSES ONLY

ALL OTHER DIMENSIONS SAME AS 125 LB. VALVES

STANDARD STOP VALVE
MANUAL OPERATION
HORIZONTAL ASSEMBLY

Type Y
Rotovalves

The Y line of ROTOVALVES has been developed for MANUAL OPERATION only and in sizes ranging from 1″ to 6″.

TWO-WAY, THREE-WAY, FOUR-WAY and ELBOW valves have been designed for the convenience of the Engineer or Operator where their installation is suitable.

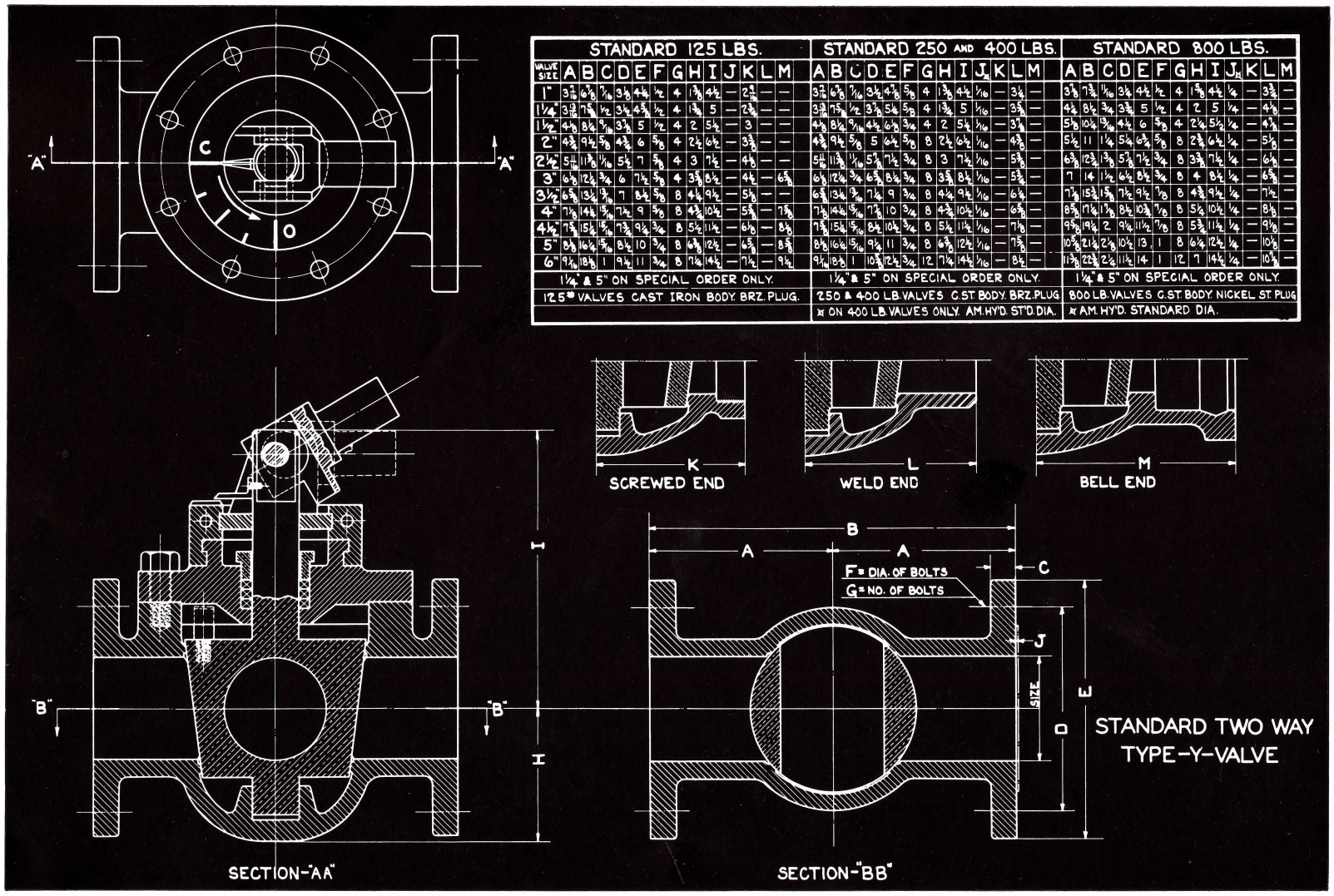
This line of valves is particularly adaptable in the field of WATER, AIR, GAS and SEWERAGE.

The type Y valve plug may be seated in any intermediate position from full open to full closed, simply by pulling down on the eccentric lever thus raising the plug out of its seat and rotating it to the desired position, after which the plug is again lowered into its seat.

All type Y valves have full circular openings through the valve and plug equal to the inlet and outlet diameters of the flanges or connections.

Type Y valves can be furnished for the above services with iron or steel bodies, bronze plugs or all iron, all bronze or all steel for working pressures of 125, 250, 400 and 800 lbs.

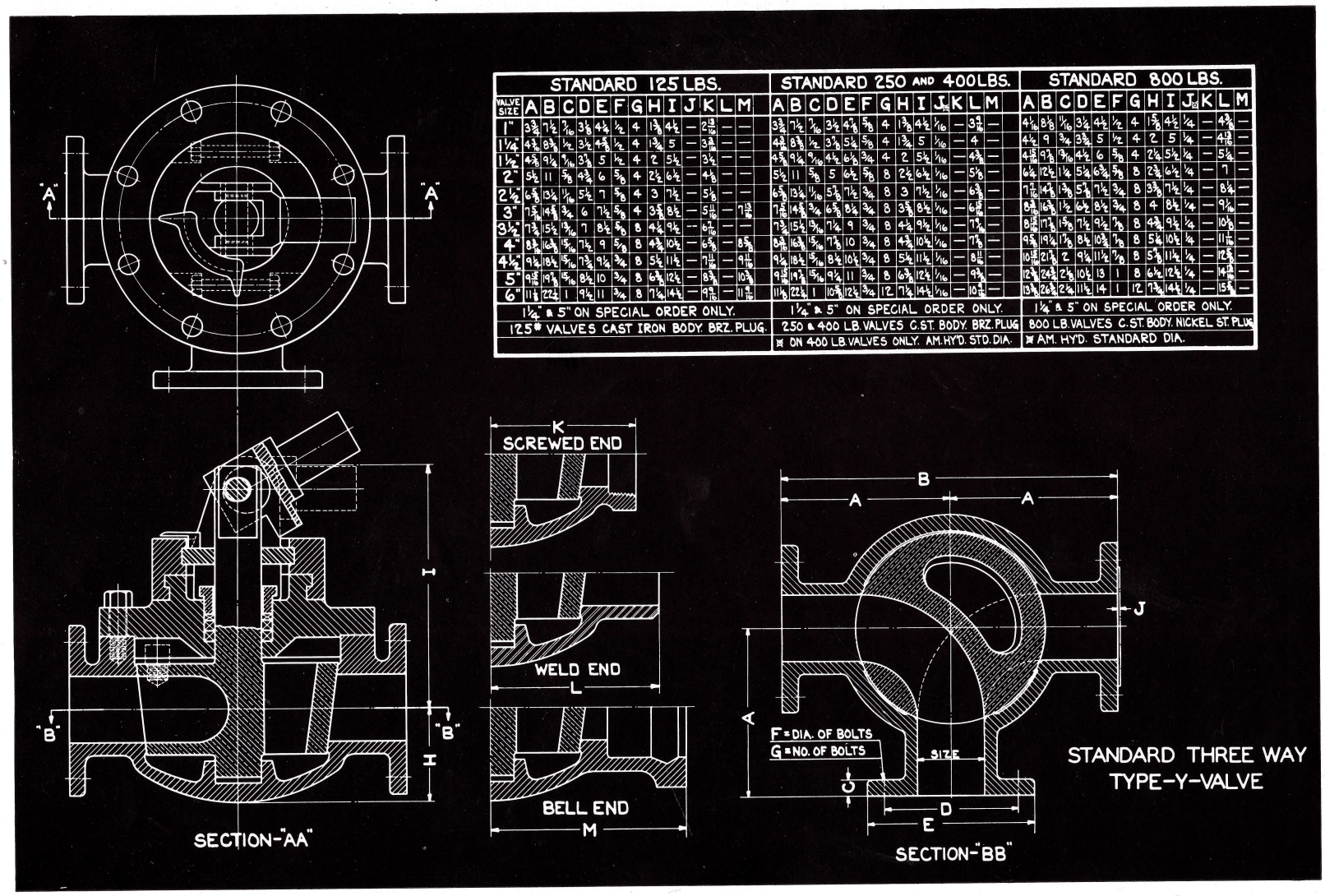
They can also be furnished with screwed, flange, bell or straight connections for welding all in accordance with the American Standards.



STANDARD 125 LBS.													
VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 11/16	6 3/8	7/16	3 3/8	4 1/8	1/2	4	1 3/8	4 1/2	—	2 3/4	—	—
1 1/4"	3 15/16	7 5/8	1/2	3 1/2	4 5/8	1/2	4	1 3/8	5	—	2 3/4	—	—
1 1/2"	4 3/8	8 1/4	9/16	3 3/4	5	1/2	4	2	5 1/4	—	3	—	—
2"	4 3/4	9 1/2	5/8	4 3/8	6	5/8	4	2 1/2	6 1/2	—	3 3/4	—	—
2 1/2"	5 1/16	11 3/8	1/16	5 1/2	7	5/8	4	3	7 1/2	—	4 3/8	—	—
3"	6 3/8	12 1/2	3/4	6	7 1/2	5/8	4	3 1/2	8 1/2	—	4 1/2	—	6 3/8
3 1/2"	6 5/8	13 1/2	3/4	7	8 1/4	5/8	8	4 1/4	9 1/2	—	5 1/8	—	—
4"	7 1/8	14 3/8	5/8	7 1/4	9	5/8	8	4 1/2	10 1/2	—	5 3/8	—	7 5/8
4 1/2"	7 5/8	15 1/4	15/16	7 3/4	9 3/4	3/4	8	5 1/4	11 1/4	—	6 1/8	—	8 1/8
5"	8 1/8	16 1/4	5/8	8 1/2	10	3/4	8	6 3/8	12 1/2	—	6 3/8	—	8 3/8
6"	9 1/16	18 3/8	1	9 1/2	11	3/4	8	7 1/4	14 1/2	—	7 1/2	—	9 1/2
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
125# VALVES CAST IRON BODY. BRZ. PLUG.													

STANDARD 250 AND 400 LBS.													
	A	B	C	D	E	F	G	H	I	J	K	L	M
	3 7/16	6 3/8	7/16	3 1/4	4 1/8	5/8	4	1 3/8	4 1/2	1/16	—	3 1/4	—
	3 7/8	7 5/8	1/2	3 1/2	4 5/8	5/8	4	1 3/4	5	1/16	—	3 5/8	—
	4 3/8	8 1/4	9/16	4 1/4	6 1/2	3/4	4	2	5 1/4	1/16	—	3 7/8	—
	4 3/4	9 1/4	5/8	5	6 1/4	5/8	8	2 1/4	6 1/2	1/16	—	4 3/8	—
	5 1/16	11 3/8	1/16	5 1/4	7 1/2	3/4	8	3	7 1/2	1/16	—	5 3/8	—
	6 3/8	12 1/4	3/4	6 3/8	8 1/4	3/4	8	3 5/8	8 1/2	1/16	—	5 3/8	—
	6 5/8	13 1/4	3/16	7 1/4	9	3/4	8	4 1/4	9 1/2	1/16	—	6 1/4	—
	7 1/8	14 3/8	5/16	7 1/2	10	3/4	8	4 3/4	10 1/2	1/16	—	6 5/8	—
	7 5/8	15 1/4	5/16	8 1/4	10 1/4	3/4	8	5 1/4	11 1/4	1/16	—	7 1/8	—
	8 1/8	16 1/4	5/16	9 1/4	11	3/4	8	6 3/8	12 1/2	1/16	—	7 5/8	—
	9 1/16	18 3/8	1	10 5/8	12 1/2	3/4	12	7 1/4	14 1/2	1/16	—	8 1/2	—
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
250 & 400 LB. VALVES C.ST. BODY. BRZ. PLUG.													
# ON 400 LB. VALVES ONLY. AM. HY'D. ST'D. DIA.													

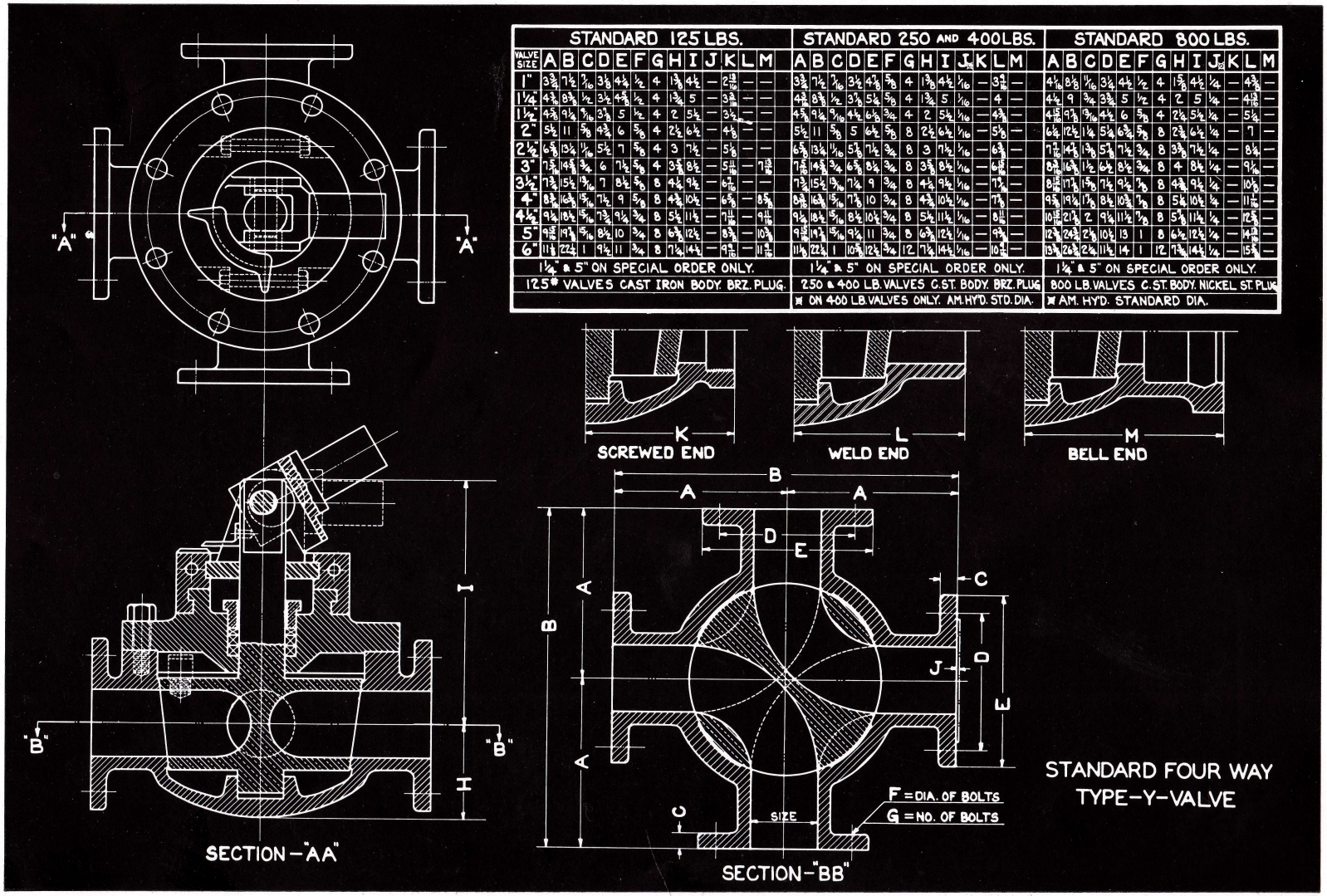
STANDARD 800 LBS.													
	A	B	C	D	E	F	G	H	I	J#	K	L	M
	3 5/8	7 3/8	1/16	3 1/4	4 1/2	1/2	4	1 5/8	4 1/2	1/4	—	3 3/4	—
	4 1/2	8 1/2	3/4	3 3/4	5	1/2	4	2	5	1/4	—	4 1/8	—
	5 1/8	10 1/4	3/16	4 1/2	6	5/8	4	2 1/4	5 1/2	1/4	—	4 1/2	—
	5 1/2	11	1/4	5 1/4	6 3/4	5/8	8	2 3/4	6 1/2	1/4	—	5 1/8	—
	6 3/8	12 3/8	1/8	5 7/8	7 1/2	3/4	8	3 3/8	7 1/2	1/4	—	6 1/4	—
	7	14	1/2	6 1/2	8 1/2	3/4	8	4	8 1/2	1/4	—	6 5/8	—
	7 7/8	15 3/8	1/8	7 1/2	9 1/2	1/8	8	4 3/8	9 1/2	1/4	—	7 1/2	—
	8 5/8	17 1/8	1/8	8 1/2	10 3/8	1/8	8	5 1/2	10 1/2	1/4	—	8 1/8	—
	9 5/8	19 1/4	2	9 1/4	11 1/2	1/8	8	5 3/8	11 1/2	1/4	—	9 1/8	—
	10 3/8	21 1/8	2 1/8	10 1/2	13	1	8	6 1/4	12 1/2	1/4	—	10 1/4	—
	11 3/8	22 3/8	2 1/8	11 1/2	14	1	12	7	14 1/2	1/4	—	10 3/8	—
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
800 LB. VALVES C.ST. BODY. NICKEL ST. PLUG													
# AM. HY'D. STANDARD DIA.													



STANDARD 125 LBS.													
VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 3/8	7 1/2	1/16	3 1/8	4 1/2	1/2	4	1 3/8	4 1/2	—	2 3/16	—	—
1 1/4"	4 1/8	8 3/8	1/2	3 1/2	4 5/8	1/2	4	1 3/8	5	—	3 3/8	—	—
1 1/2"	4 5/8	9 1/4	1/16	3 7/8	5	1/2	4	2	5 1/2	—	3 1/2	—	—
2"	5 1/2	11	5/8	4 3/4	6	5/8	4	2 1/2	6 1/2	—	4 1/8	—	—
2 1/2"	6 5/8	13 1/4	1/16	5 1/2	7	5/8	4	3	7 1/2	—	5 1/8	—	—
3"	7 5/8	14 5/8	3/4	6	7 1/2	5/8	4	3 5/8	8 1/2	—	5 11/16	—	7 13/16
3 1/2"	7 1/8	15 1/2	9/16	7	8 1/2	5/8	8	4 1/4	9 1/2	—	6 7/16	—	—
4"	8 1/2	16 3/8	15/16	7 1/2	9	5/8	8	4 3/8	10 1/2	—	6 5/8	—	8 5/8
4 1/2"	9 1/4	18 1/4	5/16	7 7/8	9 1/2	3/4	8	5 1/2	11 1/2	—	7 11/16	—	9 11/16
5"	9 5/8	19 1/8	5/16	8 1/4	10	3/4	8	6 1/8	12 1/2	—	8 3/16	—	10 3/16
6"	11 1/8	22 1/4	1	9 1/2	11	3/4	8	7 1/4	14 1/2	—	9 9/16	—	11 9/16
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
125# VALVES CAST IRON BODY. BRZ. PLUG.													

STANDARD 250 AND 400 LBS.													
A	B	C	D	E	F	G	H	I	J	K	L	M	
3 3/8	7 1/2	1/16	3 1/4	4 1/2	5/8	4	1 3/8	4 1/2	1/16	—	3 3/8	—	
4 1/8	8 3/8	1/2	3 5/8	5 1/4	5/8	4	1 3/4	5	1/16	—	4	—	
4 5/8	9 1/4	5/16	4 1/2	6 3/8	3/4	4	2	5 1/2	1/16	—	4 3/8	—	
5 1/2	11	5/8	5	6 1/2	5/8	8	2 1/2	6 1/2	1/16	—	5 1/8	—	
6 5/8	13 1/4	1/16	5 1/2	7 1/2	3/4	8	3	7 1/2	1/16	—	6 3/8	—	
7 5/8	14 5/8	3/4	6 3/8	8 1/4	3/4	8	3 5/8	8 1/2	1/16	—	6 15/16	—	
7 1/8	15 1/4	5/16	7 1/4	9	3/4	8	4 1/4	9 1/2	1/16	—	7 3/4	—	
8 3/8	16 3/8	5/16	7 3/8	10	3/4	8	4 3/8	10 1/2	1/16	—	7 7/8	—	
9 1/4	18 1/4	5/16	8 1/4	10 1/2	3/4	8	5 1/2	11 1/2	1/16	—	8 11/16	—	
9 5/8	19 1/8	5/16	9 1/4	11	3/4	8	6 1/8	12 1/2	1/16	—	9 3/16	—	
11 1/8	22 1/4	1	10 3/8	12 1/2	3/4	12	7 1/4	14 1/2	1/16	—	10 3/16	—	
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
250 & 400 LB. VALVES C.ST. BODY. BRZ. PLUG													
# ON 400 LB. VALVES ONLY. AM. HY'D. STD. DIA.													

STANDARD 800 LBS.													
A	B	C	D	E	F	G	H	I	J	K	L	M	
4 1/8	8 3/8	1/16	3 1/4	4 1/2	1/2	4	1 5/8	4 1/2	1/4	—	4 3/8	—	
4 1/2	9	3/4	3 3/8	5	1/2	4	2	5	1/4	—	4 7/16	—	
4 5/8	9 1/8	3/16	4 1/2	6	5/8	4	2 1/4	5 1/2	1/4	—	5 1/4	—	
6 1/4	12 1/2	1/4	5 1/4	6 3/4	5/8	8	2 3/8	6 1/2	1/4	—	7	—	
7 7/16	14 1/4	1/8	5 1/8	7 1/2	3/4	8	3 3/8	7 1/2	1/4	—	8 1/4	—	
8 1/4	16 3/8	1/2	6 1/2	8 1/2	3/4	8	4	8 1/2	1/4	—	9 1/16	—	
8 1/2	17 1/8	1/8	7 1/2	9 1/2	7/8	8	4 3/8	9 1/2	1/4	—	10 1/8	—	
9 5/8	19 1/2	1/8	8 1/4	10 1/2	1/8	8	5 1/8	10 1/2	1/4	—	11 1/16	—	
10 1/16	21 1/2	2	9 1/4	11 1/2	1/8	8	5 3/8	11 1/2	1/4	—	12 3/8	—	
12 1/8	24 3/8	2 1/8	10 1/2	13	1	8	6 1/2	12 1/2	1/4	—	14 1/16	—	
13 1/4	26 3/8	2 1/8	11 1/2	14	1	12	7 1/8	14 1/2	1/4	—	15 3/8	—	
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
800 LB. VALVES C.ST. BODY. NICKEL ST. PLUG													
# AM. HY'D. STANDARD DIA.													

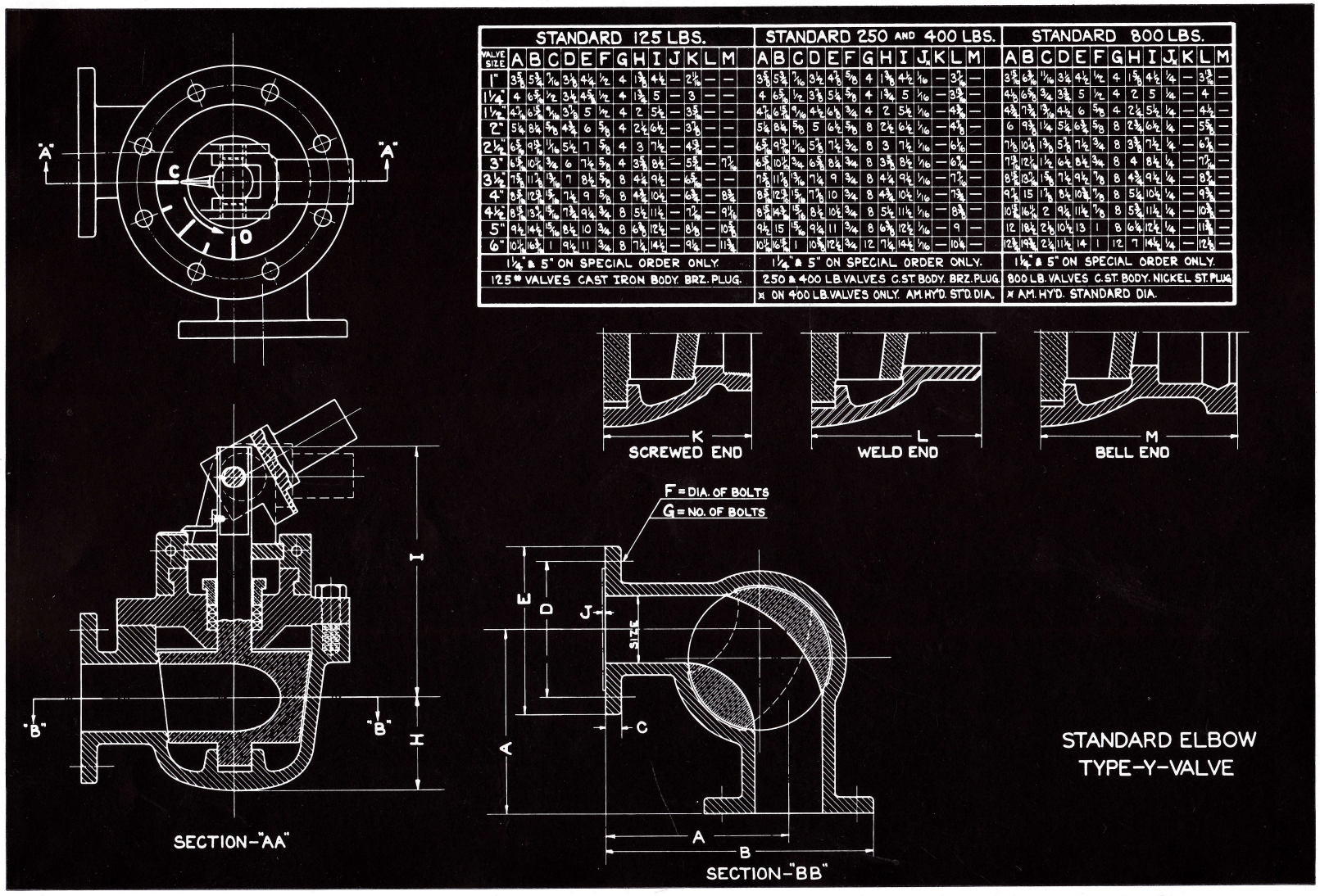


VALVE SIZE	STANDARD 125 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M	STANDARD 250 AND 400 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M	STANDARD 800 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 3/8	7 1/2	7/16	3 3/8	4 1/4	1/2	4	1 3/8	4 1/2	—	2 13/16	—	—	3 3/8	7 1/2	7/16	3 1/2	4 5/8	5/8	4	1 3/8	4 1/2	1/16	—	3 3/8	—	—	4 1/16	8 5/8	1/16	3 1/4	4 1/2	1/2	4	1 5/8	4 1/2	1/4	—	4 3/8	—
1 1/4"	4 3/8	8 3/4	1/2	3 1/4	4 5/8	1/2	4	1 3/4	5	—	3 3/16	—	—	4 3/8	8 3/4	1/2	3 1/2	5 1/4	5/8	4	1 3/4	5	1/16	—	4	—	—	4 1/4	9	3/4	3 3/4	5	1/2	4	2	5	1/4	—	4 13/16	—
1 1/2"	4 5/8	9 1/4	9/16	3 1/2	5	1/2	4	2	5 1/2	—	3 1/2	—	—	4 5/8	9 1/4	9/16	4 1/2	6 3/8	3/4	4	2	5 1/2	1/16	—	4 3/8	—	—	4 15/16	9 7/8	9/16	4 1/4	6	5/8	4	2 1/4	5 1/4	1/4	—	5 1/4	—
2"	5 1/2	11	5/8	4 3/4	6	5/8	4	2 1/2	6 1/2	—	4 1/8	—	—	5 1/2	11	5/8	5	6 3/8	5/8	8	2 1/2	6 1/2	1/16	—	5 1/8	—	—	6 1/4	12 1/2	1/4	5 1/4	6 3/4	5/8	8	2 3/8	6 1/2	1/4	—	7	—
2 1/2"	6 5/8	13 1/4	1/16	5 1/2	7	5/8	4	3	7 1/2	—	5 1/8	—	—	6 5/8	13 1/4	1/16	5 1/2	7 1/2	3/4	8	3	7 1/2	1/16	—	6 3/8	—	—	7 7/16	14 7/8	3/8	5 1/4	7 1/2	3/4	8	3 3/8	7 1/2	1/4	—	8 1/4	—
3"	7 5/8	14 3/4	3/4	6	7 1/2	5/8	4	3 1/2	8 1/2	—	5 11/16	—	7 15/16	7 5/8	14 3/4	3/4	6 5/8	8 1/4	3/4	8	3 5/8	8 1/2	1/16	—	6 5/8	—	—	8 3/8	16 5/8	1/2	6 1/2	8 1/2	3/4	8	4	8 1/4	1/4	—	9 1/4	—
3 1/2"	7 3/4	15 1/2	13/16	7	8 1/2	5/8	8	4 1/2	9 1/2	—	6 7/16	—	—	7 3/4	15 1/2	13/16	7 1/4	9	3/4	8	4 1/2	9 1/2	1/16	—	7 1/4	—	—	8 15/16	17 7/8	15/16	7 1/4	9 1/2	7/8	8	4 3/8	9 1/2	1/4	—	10 1/8	—
4"	8 3/8	16 3/4	15/16	7 1/2	9	5/8	8	4 1/2	10 1/2	—	6 5/8	—	8 5/8	8 3/8	16 3/4	15/16	7 1/2	10	3/4	8	4 1/2	10 1/2	1/16	—	7 1/8	—	—	9 5/16	19 1/4	1 1/16	8 1/4	10 3/4	7/8	8	5 1/8	10 1/2	1/4	—	11 5/16	—
4 1/2"	9 1/4	18 1/2	1 1/16	7 3/4	9 1/4	3/4	8	5 1/2	11 1/2	—	7 11/16	—	9 11/16	9 1/4	18 1/2	1 1/16	8 1/2	10 3/4	3/4	8	5 1/2	11 1/2	1/16	—	8 1/8	—	—	10 15/16	21 7/8	2	9 1/4	11 1/2	7/8	8	5 1/4	11 1/4	1/4	—	12 5/8	—
5"	9 15/16	19 7/8	1 1/16	8 1/4	10	3/4	8	6 1/2	12 1/2	—	8 3/8	—	10 3/8	9 15/16	19 7/8	1 1/16	9 1/2	11	3/4	8	6 1/2	12 1/2	1/16	—	9 1/8	—	—	12 3/8	24 3/4	2 1/16	10 1/2	13	1	8	6 1/2	12 1/2	1/4	—	14 1/16	—
6"	11 1/8	22 1/4	1	9 1/4	11	3/4	8	7 1/4	14 1/2	—	9 5/16	—	11 5/16	11 1/8	22 1/4	1	10 5/8	12 1/4	3/4	12	7 1/4	14 1/2	1/16	—	10 1/4	—	—	13 3/8	26 3/4	2 1/4	11 1/2	14	1	12	7 3/8	14 1/2	1/4	—	15 3/4	—

1 1/4" & 5" ON SPECIAL ORDER ONLY.
125# VALVES CAST IRON BODY. BRZ. PLUG.

1 1/4" & 5" ON SPECIAL ORDER ONLY.
250 & 400 LB. VALVES C.ST. BODY. BRZ. PLUG
ON 400 LB. VALVES ONLY. AM. HYD. STD. DIA.

1 1/4" & 5" ON SPECIAL ORDER ONLY.
800 LB. VALVES C. ST. BODY. NICKEL ST. PLUG
AM. HYD. STANDARD DIA.



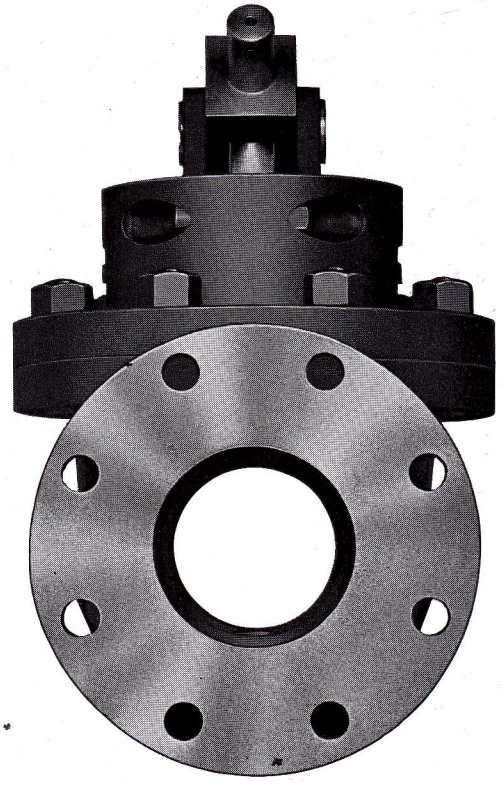
VALVE SIZE	STANDARD 125 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 5/8	5 3/4	1/16	3 1/4	4 1/4	1/2	4	1 3/8	4 1/2	—	2 1/16	—	—
1 1/4"	4	6 5/8	1/2	3 1/4	4 5/8	1/2	4	1 3/8	5	—	3	—	—
1 1/2"	4 1/2	6 5/8	3/16	3 3/8	5	1/2	4	2	5 1/8	—	3 3/8	—	—
2"	5 1/8	8 1/4	5/8	4 3/8	6	5/8	4	2 1/4	6 1/2	—	3 7/8	—	—
2 1/2"	6 5/8	9 3/8	1/16	5 1/2	7	5/8	4	3	7 1/16	—	4 3/8	—	—
3"	6 5/8	10 1/2	3/16	6	7 1/2	5/8	4	3 3/8	8 1/2	—	5 3/8	—	7 1/2
3 1/2"	7 5/8	11 1/2	3/16	7	8 1/2	5/8	8	4 1/4	9 1/2	—	6 3/8	—	—
4"	8 3/8	12 3/8	5/16	7 1/4	9	5/8	8	4 1/2	10 1/4	—	6 3/4	—	8 3/8
4 1/2"	8 5/8	13 3/8	5/16	7 3/8	9 1/4	3/4	8	5 1/8	11 1/2	—	7 1/4	—	9 1/4
5"	9 1/2	14 1/2	5/16	8 1/2	10	3/4	8	6 3/8	12 1/2	—	8 1/8	—	10 3/8
6"	10 1/2	16 3/8	1	9 1/2	11	3/4	8	7 1/4	14 1/2	—	9 1/8	—	11 3/8
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
125 # VALVES CAST IRON BODY. BRZ. PLUG.													

VALVE SIZE	STANDARD 250 AND 400 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 5/8	5 3/8	1/16	3 1/4	4 3/8	5/8	4	1 3/8	4 1/2	1/16	—	3 7/16	—
1 1/4"	4	6 5/8	1/2	3 5/8	5 1/4	5/8	4	1 3/4	5	1/16	—	3 3/4	—
1 1/2"	4 1/2	6 5/8	9/16	4 1/8	6 1/8	3/4	4	2	5 1/2	1/16	—	4 3/8	—
2"	5 1/8	8 1/4	5/8	5	6 1/2	5/8	8	2 1/8	6 1/2	1/16	—	4 7/8	—
2 1/2"	6 5/8	9 3/8	11/16	5 1/2	7 1/4	3/4	8	3	7 1/2	1/16	—	6 1/16	—
3"	6 5/8	10 1/2	3/4	6 3/8	8 1/4	3/4	8	3 1/8	8 1/2	1/16	—	6 3/4	—
3 1/2"	7 5/8	11 1/2	13/16	7 1/4	9	3/4	8	4 1/4	9 1/2	1/16	—	7 7/16	—
4"	8 3/8	12 3/8	15/16	7 1/8	10	3/4	8	4 1/2	10 1/2	1/16	—	7 7/8	—
4 1/2"	8 5/8	14 3/8	15/16	8 1/4	10 1/2	3/4	8	5 1/8	11 1/2	1/16	—	8 3/8	—
5"	9 1/2	15	15/16	9 1/2	11	3/4	8	6 3/8	12 1/2	1/16	—	9	—
6"	10 1/2	16 3/8	1	10 5/8	12 3/4	3/4	12	7 1/4	14 1/2	1/16	—	10 1/4	—
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
250 & 400 LB. VALVES C. ST. BODY. BRZ. PLUG.													
x ON 400 LB. VALVES ONLY. AM. HY'D. ST'D. DIA.													

VALVE SIZE	STANDARD 800 LBS. A	B	C	D	E	F	G	H	I	J	K	L	M
1"	3 5/8	6 3/8	1/16	3 1/4	4 1/2	1/2	4	1 5/8	4 1/2	1/4	—	3 13/16	—
1 1/4"	4 1/8	6 5/8	3/16	3 3/8	5	1/2	4	2	5	1/4	—	4	—
1 1/2"	4 3/8	7 3/8	5/16	4 1/2	6	5/8	4	2 1/4	5 1/2	1/4	—	4 1/2	—
2"	6	9 3/8	1/4	5 1/4	6 3/8	5/8	8	2 3/4	6 1/2	1/4	—	5 5/8	—
2 1/2"	7 1/8	10 1/8	1/4	5 7/8	7 1/8	3/4	8	3 3/8	7 1/2	1/4	—	6 1/8	—
3"	7 3/8	12 1/4	1/2	6 1/2	8 1/4	3/4	8	4	8 1/2	1/4	—	17/16	—
3 1/2"	8 5/8	13 3/8	1/4	7 1/4	9 1/8	7/8	8	4 3/8	9 1/2	1/4	—	8 1/2	—
4"	9 1/2	15	1/8	8 1/4	10 1/8	7/8	8	5 1/8	10 1/4	1/4	—	9 1/8	—
4 1/2"	10 3/8	16 1/4	2	9 1/8	11 1/8	7/8	8	5 3/8	11 1/2	1/4	—	10 1/4	—
5"	12	18 1/4	2 1/8	10 1/4	13	1	8	6 1/4	12 1/2	1/4	—	11 3/8	—
6"	12 3/8	19 1/8	2 1/8	11 1/2	14	1	12	7	14 1/8	1/4	—	12 1/8	—
1 1/4" & 5" ON SPECIAL ORDER ONLY.													
800 LB. VALVES C. ST. BODY. NICKEL ST. PLUG.													
x AM. HY'D. STANDARD DIA.													

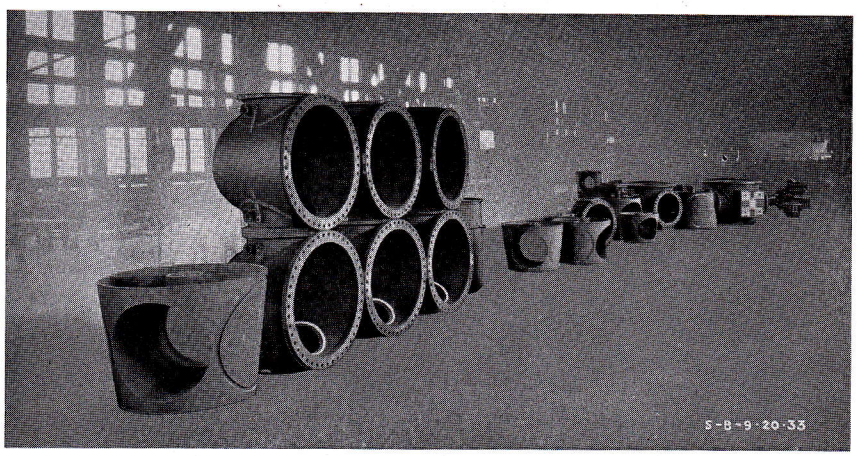
STANDARD ELBOW
TYPE-Y-VALVE

Side view of Two-way 4-inch type Y ROTOVALVE showing operating mechanism, which is the same for two-way, three-way, four-way or Elbow Valves. Covers for operating mechanism at extra cost if desired for valves that may be exposed to the elements.



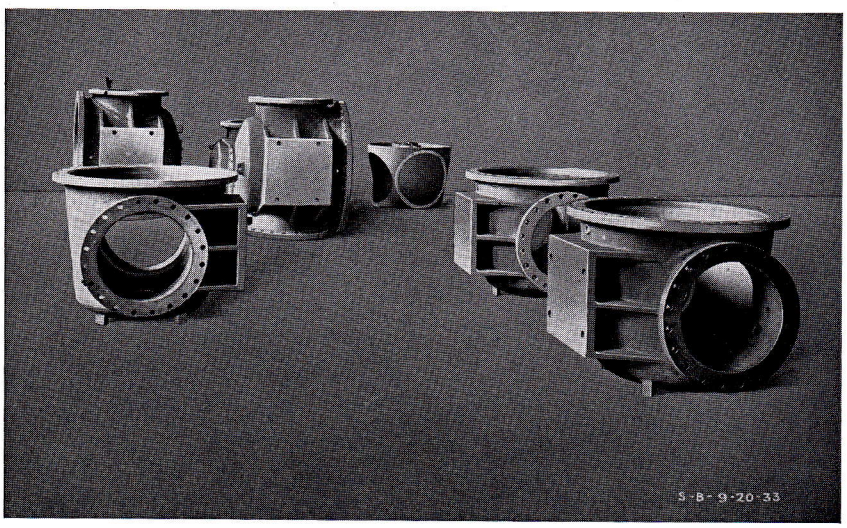
Four inch Two-way type Y ROTOVALVE showing full circular opening through the body and plug, the diameter being the same from flange to flange.

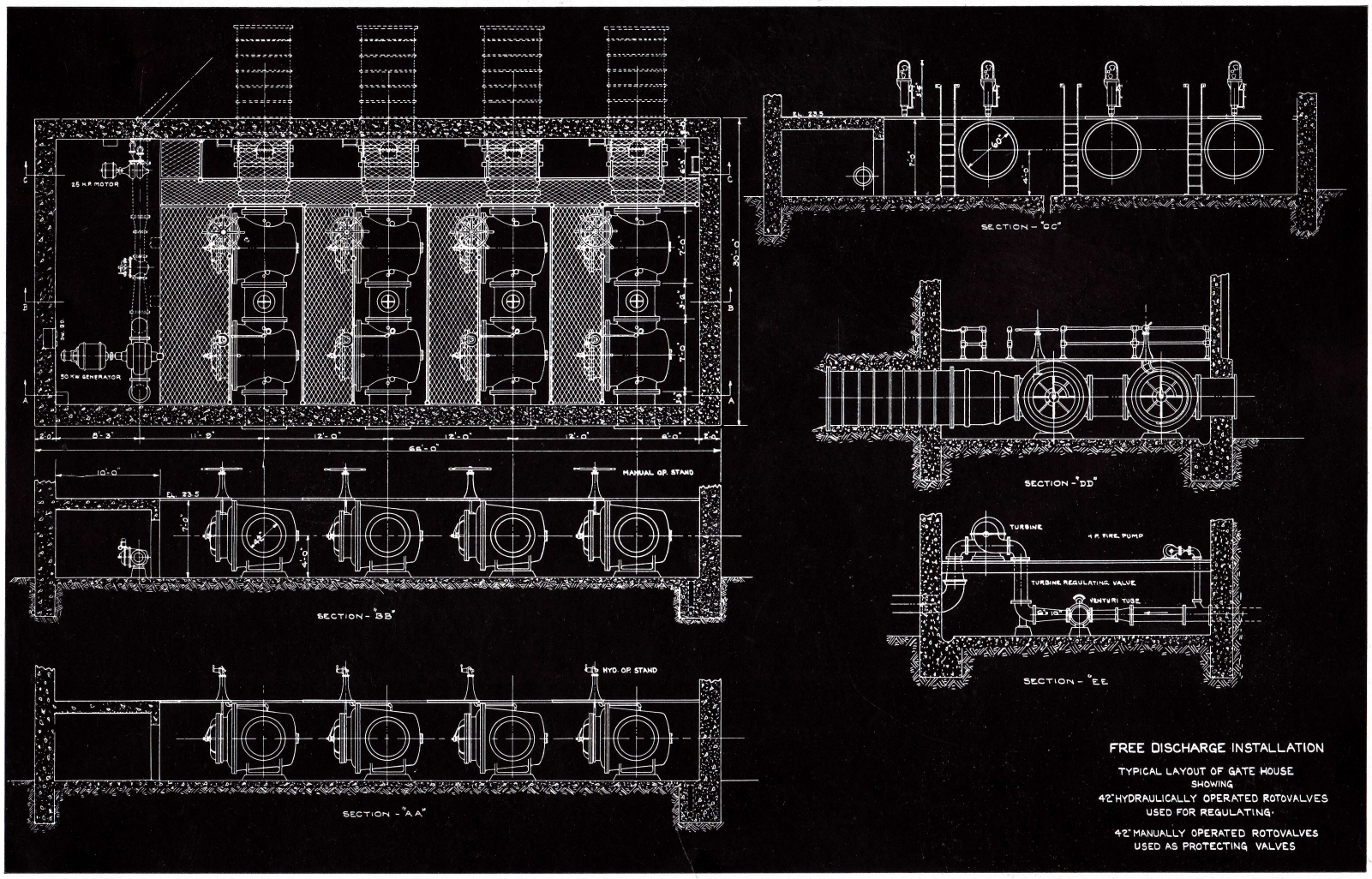
The plugs of all types of Y valves are first unseated, rotated and reseated and may be rotated and seated in any intermediate position.



30- and 36-inch valve bodies and plugs. Showing the seat rings. Also a 36-inch plug before seat rings have been installed.

24-inch bodies and plug in shop. The plug shown is completely finished with seat rings.

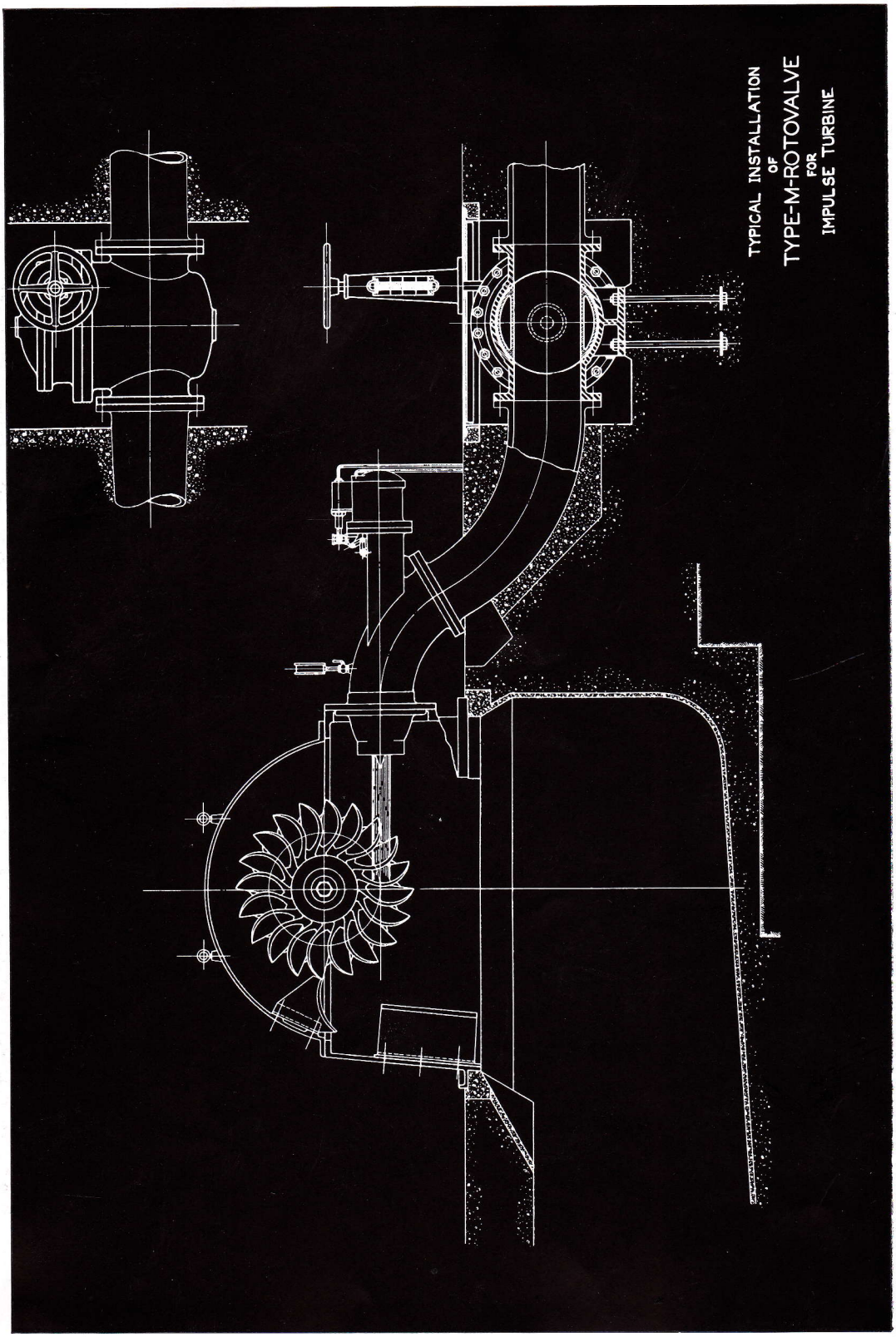




FREE DISCHARGE INSTALLATION

TYPICAL LAYOUT OF GATE HOUSE
SHOWING
42" HYDRAULICALLY OPERATED ROTOVALVES
USED FOR REGULATING.

42" MANUALLY OPERATED ROTOVALVES
USED AS PROTECTING VALVES


TYPICAL INSTALLATION
OF
TYPE-M-ROTOVALVE
FOR
IMPULSE TURBINE

LOSSES IN FEET OF WATER THROUGH STANDARD ROTOVALVES CALCULATED FROM LABORATORY TESTS

Velocity in Ft. per Sec.	VALVE SIZES												
	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	42″	48″
2.0	.0047	.0044	.0041	.0037	.0035	.0034	.0032	.0031	.003	.0028	.0028	.0027	.0025
3.0	.010	.0034	.0087	.0078	.0076	.0073	.007	.0066	.0083	.006	.0059	.0057	.0053
4.0	.017	.016	.0148	.0134	.015	.0124	.010	.011	.010	.010	.01	.098	.0091
4.5	.021	.020	.0185	.0170	.016	.015	.014	.014	.013	.013	.012	.012	.011
5.0	.026	.024	.022	.020	.02	.019	.018	.017	.016	.015	.015	.015	.014
5.5	.031	.029	.027	.024	.023	.022	.021	.020	.019	.018	.018	.017	.016
6.0	.036	.034	.031	.028	.027	.026	.025	.024	.022	.022	.021	.020	.019
6.5	.042	.039	.036	.033	.031	.030	.029	.028	.026	.025	.024	.023	.022
7.0	.048	.045	.042	.038	.037	.035	.034	.032	.03	.029	.028	.027	.026
7.5	.053	.051	.047	.043	.042	.040	.038	.036	.034	.033	.032	.031	.029
8.0	.061	.057	.053	.048	.047	.045	.043	.04	.038	.037	.036	.033	.033
8.5	.069	.064	.060	.054	.052	.050	.048	.045	.043	.042	.04	.039	.037
9.0	.076	.071	.066	.060	.058	.055	.053	.05	.048	.046	.044	.043	.041
9.5	.084	.079	.073	.066	.064	.061	.058	.055	.052	.05	.048	.047	.045
10.0	.093	.087	.081	.073	.071	.068	.065	.061	.057	.056	.054	.053	.05
10.5	.102	.095	.088	.080	.077	.074	.071	.067	.063	.061	.059	.058	.054
11.0	.111	.104	.096	.087	.084	.081	.077	.073	.069	.067	.065	.063	.059
11.5	.121	.113	.105	.095	.092	.088	.084	.08	.075	.071	.07	.068	.064
12.0	.130	.122	.113	.102	.099	.095	.091	.086	.081	.078	.076	.073	.069
13.0	.131	.141	.131	.119	.115	.110	.105	.10	.095	.081	.088	.085	.08
14.0	.174	.162	.150	.136	.131	.126	.121	.114	.103	.105	.101	.097	.092
15.0	.197	.183	.171	.155	.150	.143	.137	.130	.123	.119	.115	.112	.105
16.0	.221	.206	.191	.174	.168	.160	.153	.145	.139	.133	.128	.125	.118
17.0	.249	.232	.215	.195	.187	.180	.171	.163	.157	.149	.144	.141	.132
18.0	.276	.258	.239	.217	.209	.200	.19	.182	.174	.165	.160	.156	.146
19.0	.306	.286	.266	.240	.228	.222	.211	.201	.193	.182	.178	.173	.163
20.0	.335	.314	.290	.264	.253	.244	.233	.221	.212	.20	.195	.190	.178
21.0	.368	.344	.319	.289	.278	.267	.254	.242	.232	.219	.214	.209	.198
22.0	.400	.375	.348	.315	.305	.291	.288	.264	.253	.240	.234	.229	.213
23.0	.434	.405	.376	.341	.327	.315	.300	.285	.274	.26	.252	.246	.231
24.0	.470	.440	.407	.368	.353	.341	.327	.309	.295	.282	.274	.265	.249
25.0	.506	.473	.439	.398	.380	.368	.350	.333	.319	.303	.294	.287	.269
30.0	.710	.665	.615	.537	.536	.515	.391	.467	.447	.423	.414	.41	.377
35.0	.947	.835	.820	.744	.707	.687	.654	.622	.597	.565	.55	.536	.503
40.0	1.210	1.130	1.050	.950	.900	.878	.837	.796	.763	.72	.704	.685	.643

CALCULATED DISCHARGE THROUGH ROTOVALVES BASED ON VALVE CAPACITIES ONLY

NET HEAD AT ORIFICE		Velocity of Discharge In Feet per Second	DISCHARGE IN CUBIC FEET PER SECOND																
Lbs.	Feet		6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	42″	48″	54″	60″	72″	84″	96″
10	23.1	38.58	7.57	13.47	21.05	30.30	41.1	53.8	68.2	84.2	122.0	189.8	273.0	370	484	613	755	1089	1489	1935
15	34.7	47.25	9.25	16.50	25.8	37.08	50.2	65.2	83.6	103.1	148.0	232.0	336.0	453	593	750	923	1332	1838	2367
20	46.2	54.55	10.70	19.03	29.8	42.75	58.1	75.4	96.7	119.0	170.5	269.0	385.0	524	685	869	1064	1537	2103	2742
25	57.8	60.99	11.86	21.33	33.2	47.8	65.0	84.2	108.0	133.0	191.5	299.0	430.0	585	765	969	1188	1719	2353	3060
30	69.3	66.82	13.10	23.35	36.6	52.5	71.5	92.4	118.9	145.9	210.0	329.0	472.0	642	841	1070	1313	1905	2605	3388
35	80.9	72.16	14.13	25.15	39.3	56.7	76.9	99.5	128.0	155.8	226.0	354.0	508.0	692	905	1145	1408	2101	2787	3605
40	92.4	77.14	15.12	27.0	42.2	60.5	82.3	106.5	137.0	167.8	242.0	378.0	543.0	740	969	1228	1505	2177	2980	3879
45	104.0	81.83	16.04	28.6	44.6	64.3	87.2	112.8	143.2	177.9	256.5	402.0	577.0	786	1046	1305	1613	2313	3161	4101
50	115.5	86.26	16.90	30.1	47.0	67.8	92.0	120.8	153.1	187.9	271.0	422.0	609.0	828	1084	1372	1699	2434	3332	4323
55	127.1	90.46	17.72	31.55	49.3	71.0	96.5	125.1	160.2	197.0	284.0	443.0	638.0	868	1134	1437	1780	2547	3480	4535
60	138.6	94.49	18.53	32.9	51.6	74.2	100.0	132.0	167.5	206.0	297.0	463.0	660.0	906	1189	1502	1859	2667	3646	4737
65	150.2	98.35	19.27	34.22	53.7	76.1	104.2	137.0	174.0	214.0	309.0	483.0	694.0	944	1232	1564	1939	2769	3798	4940
70	161.7	102.06	20.0	35.62	55.7	80.1	108.2	141.9	181.0	222.0	320.0	501.0	720.0	978	1281	1626	2010	2879	3939	5121
75	173.3	105.65	20.72	36.85	57.7	83.0	111.8	147.5	187.1	231.0	331.0	518.0	745.0	1013	1326	1677	2081	2980	4070	5276
80	184.8	109.11	21.40	38.08	59.6	85.7	115.4	152.6	191.3	238.0	343.0	536.0	770.0	1048	1363	1735	2149	3080	4210	5475
85	196.4	112.46	22.20	39.2	61.3	88.3	118.8	157.2	199.2	245.0	354.0	558.0	793.0	1081	1409	1788	2217	3170	4345	5635
90	207.9	115.72	22.62	40.3	62.8	90.6	124.0	161.2	203.2	252.0	363.0	572.0	815.0	1110	1450	1838	2275	3250	4465	5800
95	219.5	118.89	23.35	41.5	64.8	93.3	125.6	166.0	210.8	258.0	373.0	584.0	839.0	1130	1492	1889	2370	3355	4575	5970

VELOCITY IN FEET PER SECOND THROUGH PIPE OR ROTOVALVES

Millions of Gallons per 24 Hours	VALVE SIZES																	
	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″	30″	36″	42″	48″	54″	60″	72″	84″
.05	0.88	0.39	0.22															
.06	1.07	0.47	0.27															
.07	1.26	0.55	0.31	0.19														
.08	1.45	0.63	0.36	0.22														
.09	1.61	0.71	0.40	0.25	0.18	0.13												
.10	1.78	0.79	0.45	0.28	0.20	0.16	0.11	0.09	0.07									
.11	1.96	0.87	0.49	0.31	0.22	0.18	0.12	0.10	0.08									
.12	2.15	0.95	0.53	0.34	0.23	0.19	0.13	0.11	0.09									
.13	2.30	1.02	0.57	0.37	0.25	0.21	0.15	0.13	0.10									
.14	2.49	1.10	0.62	0.40	0.27	0.23	0.16	0.14	0.12									
.15	2.67	1.18	0.67	0.43	0.29	0.25	0.17	0.15	0.13									
.20	3.56	1.58	0.89	0.56	0.39	0.31	0.22	0.17	0.14	0.10	0.06							
.30	5.34	2.36	1.33	0.85	0.59	0.46	0.33	0.27	0.21	0.15	0.10							
.40	7.12	3.15	1.77	1.13	0.79	0.61	0.44	0.36	0.28	0.20	0.13	0.09						
.50	8.80	3.94	2.22	1.42	0.99	0.77	0.55	0.44	0.35	0.25	0.16	0.11						
.60	10.70	4.73	2.66	1.70	1.18	0.92	0.66	0.53	0.43	0.30	0.19	0.13						
.70	12.60	5.52	3.10	1.99	1.38	1.07	0.77	0.63	0.50	0.35	0.22	0.15						
.80	14.50	6.30	3.55	2.27	1.58	1.22	0.88	0.72	0.57	0.40	0.26	0.17						
.90	16.10	7.09	3.99	2.55	1.77	1.38	0.99	0.82	0.64	0.45	0.29	0.19						
1.00	17.80	7.88	4.43	2.84	1.97	1.60	1.11	0.92	0.71	0.49	0.32	0.22	0.16	0.12	0.10	0.08	0.06	
2.00	35.60	15.76	8.86	5.67	3.94	3.20	2.22	1.84	1.42	0.98	0.63	0.44	0.32	0.24	0.19	0.16	0.12	0.08
3.00	53.40	23.64	13.30	8.51	5.91	4.80	3.33	2.76	2.13	1.48	0.95	0.66	0.48	0.36	0.28	0.24	0.17	0.12
4.00	71.20	31.52	17.72	11.35	7.88	6.40	4.43	3.68	2.84	1.97	1.26	0.88	0.64	0.49	0.37	0.32	0.22	0.16
5.00	88.00	33.94	22.16	14.20	9.85	8.00	5.54	4.60	3.55	2.46	1.58	1.09	0.80	0.62	0.48	0.40	0.27	0.20
10.00		78.80	44.30	28.40	19.70	16.00	11.08	9.20	7.09	4.92	3.15	2.19	1.61	1.23	0.97	0.79	0.55	0.41
20.00			88.60		39.40	32.00	22.16	18.40	14.18	9.85	6.30	4.38	3.22	2.46	1.95	1.58	1.09	0.82
30.00					78.80	48.00	33.30	27.60	21.27	14.77	9.46	6.57	4.82	3.69	2.92	2.36	1.64	1.22
40.00							44.43	36.80	28.36	19.70	12.61	8.76	6.45	4.92	3.89	3.15	2.19	1.64
50.00							55.40	46.00	35.50	24.60	15.75	10.95	8.04	6.16	4.86	3.94	2.74	2.04
100.00								92.00	71.00	49.20	31.50	21.90	16.08	12.31	9.73	7.88	5.47	4.07
200.00											63.00	43.80	32.16	24.62	19.46	15.76	10.94	8.13

GENERAL INFORMATION

The areas of circles are to each other as the square of their diameters. Doubling the diameter of a pipe or cylinder increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

Atmospheric pressure, at sea level, is usually estimated at 14.7 pounds per square inch, and this pressure will maintain a column of water 33.9 feet high, when the normal pressure in the column is relieved by the creation of a vacuum. This is the theoretical distance that water may be drawn by suction. In practice, however, pumps should not be placed over 25 feet above the water supply, and nearer if possible.

Every foot of height in a column of water represents .434 pound pressure to the square inch. It is common practice to estimate that every foot in height is equal to one-half pound pressure per square inch, as this allows for ordinary friction in pipes.

A gallon of water weighs 8.34 pounds, and contains 231 cubic inches. A cubic foot of water weighs 62.36 pounds, and contains 1,728 cubic inches, or 7.48 gallons.

A miner's inch of water is approximately equal to 11½ U. S. gallons per minute.

Pressure in pounds multiplied by 2.3 equals feet in height. For total for working head in feet add suction lift.

Imperial gallon	= 277.46	cubic inches.
Imperial gallon	= .16	cubic foot.
Imperial gallon	= 10.00	pounds.
Imperial gallon	= 1.20	U. S. gallons.
U. S. gallon	= 231.00	cubic inches.
U. S. gallon	= .134	cubic foot.
U. S. gallon	= 8.33	pounds.
U. S. gallon	= .83	imperial gallon.
One lb. of water	= 27.74	cubic inches.
One lb. of water	= .083	U. S. gallon.
One lb. of water	= .10	imperial gallon.
One cwt. of water	= 11.2	imperial gallons.
One cwt. of water	= 13.44	U. S. gallons.
One ton of water	= 35.96	cubic feet.
One ton of water	= 224.0	imperial gallons.
One ton of water	= 268.8	U. S. gallons.
One cubic inch of water	= .036	pound.
One cubic inch of water	= .0036	imperial gallon.
One cubic inch of water	= .0043	U. S. gallon.
One cubic foot of water	= .027	ton.
One cubic foot of water	= .55	cwt.
One cubic foot of water	= 62.27	pounds.
One cubic foot of water	= 6.22	imperial gallons.
One cubic foot of water	= 7.48	U. S. gallons.

COMPOUND UNITS

Measures of Pressure and Weight

1 lb. per square inch	=	144 lbs. per square foot. 2.0355 ins. of mercury at 32° F. 2.0416 ins. of mercury at 62° F. 2.309 ft. of water at 62° F. 27.71 ins. of water at 62° F.
1 ounce per sq. in.	=	0.1276 in. of mercury at 62° F. 1.732 ins. of water at 62° F.
1 atmosphere (14.7 lbs. per sq. in.)	=	2116.3 lbs. per square foot. 33.947 ft. of water at 62° F. 30 ins. of mercury at 62° F. 29.922 ins. of mercury at 32° F. 760 millimeters of mercury at 32° F.
1 inch of water at 62° F.	=	0.03609 lb. or .5774 oz. per sq. in. 5.196 lbs. per square foot. 0.0736 in. of mercury at 62° F.
1 inch of water at 32° F.	=	5.2021 lbs. per square foot. 0.036125 lb. per square inch.
1 foot of water at 62° F.	=	0.433 lb. per square inch. 62.355 lbs. per square foot.
1 inch of mercury at 62° F.	=	0.491 lb. or 7.86 oz. per sq. in. 1.132 ft. of water at 62° F. 13.58 ins. of water at 62° F.

Pressure in Pounds per Square Inch for Different Heads of Water

At 62° F. 1 foot head = 0.433 lb. per square inch, 0.433 X 144 = 62.352 lbs. per cubic foot

Head, feet	0	1	2	3	4	5	6	7	8	9
0		0.433	0.866	1.299	1.732	2.165	2.598	3.031	3.464	3.897
10	4.330	4.763	5.196	5.629	6.062	6.495	6.928	7.361	7.794	8.227
20	8.660	9.093	9.526	9.959	10.392	10.825	11.258	11.691	12.124	12.557
30	12.990	13.423	13.856	14.289	14.722	15.155	15.588	16.021	16.454	16.887
40	17.320	17.753	18.186	18.619	19.052	19.485	19.918	20.351	20.784	21.217
50	21.650	22.083	22.156	22.949	23.382	23.815	24.248	24.681	25.114	25.547
60	25.980	26.413	26.846	27.279	27.712	28.145	28.578	29.011	29.444	29.877
70	30.310	30.743	31.176	31.609	32.042	32.475	32.908	33.341	33.774	34.207
80	34.640	35.073	35.506	35.939	36.372	36.805	37.238	37.671	38.104	38.537
90	38.970	39.403	39.836	40.269	40.702	41.135	41.568	42.001	42.436	42.867

Head in Feet of Water, Corresponding to Pressures in Pounds per Square Inch

1 lb. per square inch = 2.30947 feet head, 1 atmosphere = 14.7 lbs. per sq. inch = 33.94 ft. head

Pressure	0	1	2	3	4	5	6	7	8	9
0		2.309	4.619	6.928	9.238	11.547	13.857	16.166	18.476	20.785
10	23.0947	25.404	27.714	30.023	32.333	34.642	36.952	39.261	41.570	43.880
20	46.1894	48.499	50.808	53.118	55.427	57.737	60.046	62.356	64.665	66.975
30	69.2841	71.594	73.903	76.213	78.522	80.831	83.141	85.450	87.760	90.069
40	92.3788	94.688	96.998	99.307	101.62	103.93	106.24	108.55	110.85	113.16
50	115.4735	117.78	120.09	122.40	124.71	127.02	129.33	131.64	133.95	136.26
60	138.5682	140.88	143.19	145.50	147.81	150.12	152.42	154.73	157.04	159.35
70	161.6629	163.97	166.28	168.59	170.90	173.21	175.52	177.83	180.14	182.45
80	184.7576	187.07	189.38	191.69	194.00	196.31	198.61	200.92	203.23	205.54
90	207.8523	210.16	212.47	214.78	217.09	219.40	221.71	224.02	226.33	228.64

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